CONTENTS OF APPENDIX

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~~$&^Other;HighlightOn=**;HighlightOff=**;~~
~~**4,694,490**~~**4,965,825** [IMAGE AVAILABLE] ~~Sep. 15, 1987 L1: 2 of 2~~Oct. 23, 1990 L1: 1 of 1

Signal processing apparatus and methods

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REF-CITED:

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ABSTRACT:
~~Apparatus and methods for automatically controlling programming transmissions and presentations on television and radio equipment and monitoring the programming transmitted and presented. ("Programming" here means everything transmitted over television or radio intended for~~

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~~communication of entertainment or to instruct or inform.) The Apparatus can handle programming transmitted either over-the-air (hereinafter, "broadcast") or over hard-wire (hereinafter, "cablecast"). The apparatus receive transmissions from as many as one hundred or more channels that are sequentially scanned by one or more scanners/switches that transfer the transmissions to one or more receiver/decoders that identify signals in the programming and separate the signals from the programming transmissions. The signals may then be transferred through one or more decrypters. The separated and possibly wholly or partially decrypted signals are then transferred through one or more processors and buffers to external equipment and/or data recorders. The data recorders are adapted to output data to remote sites on predetermined instructions. In all these functions, the apparatus are governed by one or more controllers. The methods co-ordinate and instruct equipment in the transmission and presentation of radio and television programming, especially in multi-media and multi-channel presentations, and in certain other functions.~~

~~13 Claims, 22 Drawing Figures~~

~~EXMPL-CLAIM: 1~~

~~NO-PP-DRAWING: 14~~A unified system of programming communication for use on individual computer systems with capacity for generating relevant user specific information simultaneously at each station of a plurality of subscriber stations. The system includes a transmission station which is a central control system of a system of receiver station computers controlled by the station transmission. Each individual computer system is self-structuring in that any given transmission station can transmit control information causing selected apparatus at selected receiver stations to combine the computers at those stations based on the transmission of the station, thereby causing the individual computers to come under control of station. The unified system also includes apparatus for combining the user specific information generated at subscriber station into broadcast programming, so that broadcast programming is displayed at every station with user specific information displayed in the broadcast programming. The unified system includes apparatus for restricting the combined programming so that it is available only at selected stations tuned to a given transmission station's transmission. The unified system includes apparatus for documenting the use of the control signals and/or programming at said selected stations and for monitoring the availability and use, of programming.

25 Claims, 30 Drawing Figures

EXMPL-CLAIM: 20

NO-PP-DRAWING: 21

PARENT-CASE:

CROSS-REFERENCE TO RELATED APPLICATIONS

This is a continuation-in-part of a patent application Ser. No. 829,531 filed Feb. 14, 1986 now U.S. Pat. No. 4,704,725 which in turn was a continuation of a patent application Ser. No. 317,510 filed Nov. 3, 1981 now U.S. Pat. No. 4,694,490.

SUMMARY:

BACKGROUND OF THE INVENTION

~~At the present time, vast amounts of programing are transmitted through various media throughout the United States which programing is handled with significant degrees of manual processing as different, discrete units of programing transmitted on single channel systems. Broadcasters and cablecasters transmit programing with the expectation that viewers in one place tune to only one channel at a time.~~

~~On occasion and on a limited scale, the co-ordination of two media and two channels has occurred. Such co-ordination has taken the form of stereo simulcasts where one local television station broadcasts a program, generally of classical music, and simultaneously, a local radio station broadcasts the same music in stereo. But such simulcasts require significant degrees of manual processing at both the points of origination and reception.~~

~~Today great potential exists for a significant increase in the scope and scale of multi-media and multi-channel presentations. This increase is desirable because it will increase variety and add substantially to the richness of presentations as regards both entertainment and the communications of ideas and information.~~

~~This potential arises out of two simultaneous, independent trends. One is the development and growth of the so-called cable television industry whose member companies deliver locally not one but many channels of programing. The other is the widespread and growing ownership of computers, especially microcomputers in homes.~~

~~It is the object of this invention to unlock this potential by the development of means and methods which permit programing to communicate with equipment that is external to television and radio receivers, particularly computers and computer peripherals such as printers.~~

~~It is the further purpose of this invention to provide means and methods to process and monitor such transmissions and presentations at individual receiver sites and to control, in certain ways, the use of transmitted programing and the operation of certain associated equipment. Such receiver sites may be stations or systems that intend to retransmit the programing, or they may be end users of the programing. The present invention contemplates that certain data may be encrypted and that certain data collected from such processing and monitoring will automatically be transfered to a remote geographic location or locations.~~

~~In the prior art, there have been attempts to develop systems to control programing and systems to monitor programing, but the two have been treated as separate systems, and each has had limited capacity.~~

~~As regards control systems, cueing systems and equipment now exist that transmit instructions to operating equipment at receiver sites by means of tone signals that are carried, in television transmissions, in the audio portion and may be heard by the human ear. Such systems and devices are used to turn on equipment such as videotape players and recorders that have been manually loaded and to tell such equipment how long to run. Such systems operate by transmitting operating signals that precede and follow programing and are called "headers" and "trailers" respectively. The use of headers and trailers limits prior art in that headers and trailers can become separated from programing, thereby hampering automatic operations. Such prior art techniques have lacked the~~

~~capacity to process the programing in various ways including to instruct receiver-end equipment what specific programing to select to play or record other than that immediately at hand, how to load it on player or recorder equipment, when and how to play it or record it other than immediately, how to modify it, what equipment or channel or channels to transmit it on, when to transmit it, and how and where to file it or refile it or dispose of it. (Within television studios that are original transmitters of programing, certain systems and equipment do exist for certain automatic co-ordination of players, loaders, and other equipment; however, manual instructions still must be given, on site, for the co-ordination of such equipment which instructions are transmitted electronically on hardwire channels that are strictly separate from the channels on which the programing is transmitted and such instructions are never broadcast.) Such prior art systems and equipment have lacked the capacity to automatically coordinate multi-channel and multi-media presentations. They have lacked the capacity to decrypt encrypted processing signals. They have lacked the capacity to monitor whether receiver-end equipment are following instructions properly.~~

~~As regards monitoring systems, various systems and devices have been developed to determine what programing is played on television. One such system for monitoring programs is described in U.S. Pat. No. 4,025,851 to Haselwood, et al. Another that monitors by means of audio codes that are only "substantially inaudible" is described in U.S. Pat. No. 3,845,391 to Crosby. Recently devices, called addressable converters, have been developed that facilitate so-called pay-per-view marketing of programing by monitoring what individual television receivers tune to and either permitting or preventing the tuners to tune to given frequencies satisfactorily. Such prior art techniques and equipment have been limited to monitoring single broadcast stations, channels or units and have lacked the ability to monitor multimedia presentations. They have been able to monitor only the audio or the video portion of television transmissions. They have been able either to monitor what is transmitted over one channel or what is received by one or more receivers but not both. They have lacked the capacity to record and transfer information~~The invention relates to an integrated system of programming communication and involves the fields of computer processing, computer communications, television, radio, and other electronic communications; the fields of automating the handling, recording, and retransmitting of television, radio, computer, and other electronically transmitted programming; and the fields of regulating, metering, and monitoring the availability, use, and usage of such programming.

For years, television has been recognized as a most powerful medium for communicating ideas. And television is so-called "user friendly"; that is, despite technical complexity, television is easy for subscribers to use.

Radio and electronic print services such as stock brokers' so-called "tickers" and "broad tapes" are also powerful, user friendly mass media. (Hereinafter, the electronic print mass medium is called, "broadcast print.")

But television, radio, and broadcast print are only mass media. Program content is the same for every viewer. Occasionally one viewer may see, hear, or read information of specific relevance to him (as happens when a guest on a television talk show turns to the camera and says, "Hi, Mom"),

but such electronic media have no capacity for conveying user specific information simultaneously to each user.

For years, computers have been recognized as having unsurpassed capacity for processing and displaying user specific information.

But computer processing is not a mass medium. Computers operate under the control of computer programs that are inputted by specific users for specific purposes, not programs that are broadcast to and executed simultaneously at the stations of mass user audiences. And computer processing is far less user friendly than, for example, television.

Today great potential exists for combining the capacity of broadcast communications media to convey ideas with the capacity of computers to process and output user specific information. One such combination would provide a new radio-based or broadcast print medium with the capacity for conveying general information to large audiences--e.g., "Stock prices rose today in heavy trading,"--with information of specific relevance to each particular user in the audience--e.g., "but the value of your stock portfolio went down."(Hereinafter, the new media that result from such combinations are called "combined" media.)

Unlocking this potential is desirable because these new media will add substantial richness and variety to the communication of ideas, information and entertainment. Understanding complex subjects and making informed decisions will become easier.

To unlock this potential fully requires means and methods for combining and controlling receiver systems that are now separate--television and computers, radio and computers, broadcast print and computers, television and computers and broadcast print, etc.

But it requires much more.

To unlock this potential fully requires a system with efficient capacity for satisfying the demands of subscribers who have little receiver apparatus and simple information demands as well as subscribers who have extensive apparatus and complex demands. It requires capacity for transmitting and organizing vastly more information and programming than any one-channel transmission system can possibly convey at one time. It requires capacity for controlling intermediate transmission stations that receive information and programming from many sources and for organizing the information and programming and retransmitting the information and programming so as to make the use of the information and programming at ultimate receiver stations as efficient as possible.

To unlock this potential also requires efficient capacity for providing reliable audit information to (1) advertisers and others who pay for the transmission and performance of programming and (2) copyright holders, pay service operators, and others such as talent who demand, instead, to be paid. This requires capacity for identifying and recording (1) what television, radio, data, and other programming and what instruction signals are transmitted at each transmission station and (2) what is received at each receiver station as well as (3) what received programming is combined or otherwise used at each receiver station and (4) how it is received, combined, and/or otherwise used.

Moreover, this system must have the capacity to ensure that programming supplied for pay or for other conditional use is used only in accordance with those conditions. For example, subscriber station apparatus must display the commercials that are transmitted in transmissions that advertisers pay for. The system must have capacity for decrypting, in many varying ways, programming and instruction signals that are encrypted and for identifying those who pirate programming and inhibiting piracy.

It is the object of this invention to unlock this great potential in the fullest measure by means of an integrated system of programming communication that joins together all these capacities most efficiently.

Computer systems generate user specific information, but in any given computer system, any given set of program instructions that causes and controls the generation of user specific information is inputted to only one computer at a time.

Computer communications systems do transmit data point-to-multipoint. The Dataspeed Corporation division of Lotus Development Corporation of Cambridge, Mass. transmits real-time financial data over radio frequencies to microcomputers equipped with devices called "modios" that combine the features of radio receivers, modems, and decryptors. The Equatorial Communications Company of Mountain View, Calif. transmits to similarly equipped receiver systems by satellite. At each receiver station, apparatus receive the particular transmission and convert its data content into unencrypted digital signals that computers can process. Each subscriber programs his subscriber station apparatus to select particular data of interest.

This prior art is limited. It only transmits data; it does not control data processing. No system is preprogrammed to simultaneously control a plurality of central processor units, operating systems, and pluralities of computer peripheral units. None has capacity to cause simultaneous generation of user specific information at a plurality of receiver stations. None has any capacity to cause subscriber station computers to process received data, let alone in ways that are not inputted by the subscribers. None has any capacity to explain automatically why any given information might be of particular interest to any subscriber or why any subscriber might wish to select information that is not selected or how any subscriber might wish to change the way selected information is processed.

As regards broadcast media, systems in the prior art have capacity for receiving and displaying multiple images on television receivers simultaneously. ~~They have been unable to decrypt encrypted signals. They~~One such system for superimposing printed characters ~~have been able to monitor only single signal word types or word lengths that are placed, within the transmissions, in locations that are unvarying and unvariable. They have lacked the capacity to compare, assemble, and/or evaluate multi-word, multi-location signals. Except in the possible case of addressable converters, they have been unable to distinguish the absence of signals or signal words in transmissions. They have lacked the capacity to communicate processing instructions to external equipment as described in the paragraph above. It is the object of the present invention to overcome these and other deficiencies of the prior art.~~

~~(The term "signal unit" hereinafter means one complete signal instruction or information message unit. Examples of signal units are a unique code identifying a programing unit, or a unique purchase order number identifying the proper use of a programing unit, or a general instruction identifying whether a programing unit is to be retransmitted immediately or recorded for delayed transmission. The term "signal word" hereinafter means one full discrete appearance of a signal as embedded at one time in one location on a transmission. Examples of signal words are a string of one or more digital data bits encoded together on a single line of video or sequentially in audio. Such strings may or may not have predetermined data bits to identify the beginnings and ends of words. Signal words may contain parts of signal units, whole signal units, or groups of partial or whole signal units or combinations.)~~

~~It is a further object of the present invention to process and monitor signals on numerous channels by sequentially scanning each channel in a predetermined manner which manner may be varied. It is also an object of the present invention to prevent unauthorized use of signals and programing by permitting signal encryption, the variation of word numbers, word lengths, word compositions, and/or word locations. It is also an object of this system to process different signal words in different ways. It is also an object of the present invention to provide a record of signals that may be transferred to a geographically distant location on command or predetermined instruction.~~

~~Other objects of this invention will appear from the following descriptions and the appended claims.~~transmitted incrementally during the vertical blanking interval of the television scanning format is described in U.S. Pat. No. 3,891,792 to Kimura, U.S. Pat. No. 4,310,854 to Baer describes a second system for continuously displaying readable alphanumeric captions that are transmitted as digital data superimposed on a normal FM sound signal and that relate in program content to the conventional television information upon which they are displayed. These systems permit a viewer to view a primary program and a secondary program.

This prior art, too, is limited. It has no capacity to overlay any information other than information transmitted to all receiver stations simultaneously. It has no capacity to overlay any such information except in the order in which it is received. It has no capacity to cause receiver station computers to generate any information whatsoever, let alone user specific information. It has no capacity to cause overlays to commence or cease appearing at receiver stations, let alone commence and cease appearing periodically.

As regards the automation of intermediate transmission stations, various so-called "cueing" systems in the prior art operate in conjunction with network broadcast transmissions to automate the so-called "cut-in" at local television and radio stations of locally originated programming such as so-called "local spot" advertisements.

Also in the prior art, U.S. Pat. No. 4,381,522 tp Lambert describes a cable television system controlled by a minicomputer that responds to signals transmitted from viewers by telephone. In response to viewers' input preferences, the computer generates a schedule which determines what prerecorded, so-called local origination programs will be transmitted, when, and over what channels. The computer generates a video

image of this schedule which it transmits over one cable channel to viewers which permits them to see when they can view the programs they request and over what channels. Then, in accordance with the schedule, it actuates preloaded video tape, disc or film players and transmits the programming transmissions from these players to the designated cable channels by means of a controlled video switch.

This prior art, too, is limited. It has no capacity to schedule automatically or transmit any programming other than that loaded immediately at the play heads of the controlled video players. It has no capacity to load the video players or identify what programming is loaded on the players or verify that scheduled programs are played correctly. It has no capacity to cause the video players to record programming from any source. It has no capacity to receive programming transmissions or process received transmissions in any way. It has no capacity to operate under the control of instructions transmitted by broadcasters. It has no capacity to insert signals that convey information to or control, in any way, the automatic operation of ultimate receiver station apparatus other than television receivers.

As regards the automation of ultimate receiver stations, in the prior art, U.S. Pat. No. 4,337,480 to Bourassin et al. describes a dynamic interconnection system for connecting at least one television receiver to a plurality of television peripheral units. By means of a single remote keyboard, a viewer can automatically connect and disconnect any of the peripheral units without the need manually to switch systems or fasten and unfasten cabling each time. In addition, using a so-called "image-within-image" capacity, the viewer can superimpose a secondary image from a second peripheral unit upon the primary image on the television display. In this fashion, two peripheral units can be viewed simultaneously on one television receiver. U.S. Pat. No. 4,264,925 to Freeman et al. describes a multi-channel programming transmission system wherein subscribers may select manually among related programming alternatives transmitted simultaneously on separate channels.

This prior art, too, is limited. It has no capacity for interconnecting or operating a system at any time other than the time when the order to do so is entered manually at the system or remote keyboard. It has no capacity for acting on instructions transmitted by broadcasters to interconnect, actuate or tune systems peripheral to a television receiver or to actuate a television receiver or automatically change channels received by a receiver. It has no capacity for coordinating the programming content transmitted by any given peripheral system with any other programming transmitted to a television receiver. It has no capacity for controlling two separate systems such as, for example, an automatic radio and television stereo simulcast. It has no capacity for selectively connecting radio receivers to radio peripherals such as computers or printers or speakers or for connecting computers to computer peripherals (except perhaps a television set). It has no capacity for controlling the operation of decryptors or selectively inputting transmissions to decryptors or outputting transmissions from decryptors to other apparatus. It has no capacity for monitoring and maintaining records regarding what programming is selected or played on any apparatus or what apparatus is connected or how connected apparatus operate.

The prior art includes a variety of systems for monitoring programming and generating so-called "ratings." One system that monitors by means of

embedded digital signals is described in U.S. Pat. No. 4,025,851 to Haselwood, et al. Another that monitors by means of audio codes that are only "substantially inaudible" is described in U.S. Pat. No. 3,845,391 to Crosby. A third that automatically monitors a plurality of channels by switching sequentially among them and that includes capacity to monitor audio and visual quality is described in U.S. Pat. No. 4,547,804 to Greenberg.

This prior art, too, is limited. It has capacity to monitor only single broadcast stations, channels or units and lacks capacity to monitor more than one channel at a time or to monitor the combining of media. At any given monitor station, it has had capacity to monitor either what is transmitted over one or more channels or what is received on one or more receivers but not both. It has assumed monitored signals of particular format in particular transmission locations and has lacked capacity to vary formats or locations or to distinguish and act on the absence of signals or to interpret and process in any fashion signals that appear in monitored locations that are not monitored signals. It has lacked capacity to identify encrypted signals then decrypt them. It has lacked capacity to record and also transfer information to a remote geographic location simultaneously.

As regards recorder/player systems, many means and methods exist in the prior art for recording television or audio programming and/or data on magnetic, optical or other recording media and for retransmitting prerecorded programming. Video tape recorders have capacity for automatic delayed recording of television transmissions on the basis of instructions input manually by viewers. So-called "interactive video" systems have capacity for locating prerecorded television programming on a given disc and transmitting it to television receivers and locating prerecorded digital data on the same disc and transmitting them to computers.

This prior art, too, is limited. It has no capacity for automatically embedding signals in and/or removing embedded signals from a television transmission then recording the transmission. It has no capacity for controlling the connection or actuation or tuning of external apparatus. It has no capacity for retransmitting prerecorded programming and controlling the decryption of said programming, let alone doing so on the basis of signals that are embedded in said programming that contain keys for the decryption of said programming. It has no capacity for operating on the basis of control signals transmitted to recorder/players at a plurality of subscriber stations, let alone operating on the basis of such signals to record user specific information at each subscriber station.

As regards decoders and decryptors, many different systems exist, at present, that enable programming suppliers to restrict the use of transmitted programming to only duly authorized subscribers. The prior art includes so-called "addressable" systems that have capacity for controlling specific individual subscriber station apparatus by means of control instructions transmitted in broadcasts. Such systems enable broadcasters to turn off subscriber station decoder/decryptor apparatus of subscribers who do not pay their bills and turn them back on when the bills are paid.

This prior art, too, is limited. It has no capacity for decrypting

combined media programming. It has no capacity for identifying then selectively decrypting control instructions embedded in unencrypted programming transmissions. It has no capacity for identifying programming transmissions or control instructions selectively and transferring them to a decryptor for decryption. It has no capacity for transferring the output of a decryptor selectively to one of a plurality of output apparatus. It has no capacity for automatically identifying decryption keys and inputting them to a decryptor to serve as the key for any step of decryption. It has no capacity for identifying and recording the identity of what is input to or output from a decryptor. It has no capacity for decrypting a transmission then embedding a signal in the transmission--let alone for simultaneously embedding user specific signals at a plurality of subscriber stations. It has no capacity for distinguishing the absence of an expected signal or controlling any operation when such absence occurs.

Further significant limitations arise out of the failure to reconcile aspects of these individual areas of art--monitoring programming, automating ultimate receiver stations, decrypting programming, generating the programming itself, etc.--into an integrated system. These limitations are both technical and commercial.

For example, the commercial objective of the aforementioned monitoring systems of Crosby, Haselwood et. al., and Greenberg is to provide independent audits to advertisers and others who pay for programming transmissions. All require embedding signals in programming that are used only to identify programming. Greenberg, for example, requires that a digital signal be transmitted at a particular place on a select line of each frame of a television program. But television has only so much capacity for transmitting signals outside the visible image; it is inefficient for such signals to serve only one function; and broadcasters can foresee alternate potential for this capacity that may be more profitable to them. Furthermore, advertisers recognize that if the systems of Crosby, Haselwood and Greenberg distinguish TV advertisements by means of single purpose signals, television receivers and video tape recorders can include capacity for identifying said signals and suppressing the associated advertisements. Accordingly, no independent automatic comprehensive so-called "proof-of-performance" audit service has yet proven commercially viable.

As a second example, because of the lack of a viable independent audit system, each service that broadcasts encrypted programming controls and services at each subscriber station one or more receiver/decryptors dedicated to its service alone. Lacking a viable audit system, services do not transmit to shared, common receiver/decryptors.

These are just two examples of limitations that arise in the absence of an integrated system of programming communication.

It is an object of the present invention to overcome these and other limitations of the prior art.

SUMMARY OF THE INVENTION

The present invention consists of ~~methods and apparatus with several~~an integrated system of methods and ~~forms.~~

~~One method provides a technique whereby a broadcast or cablecast transmission facility can duplicate the operation of a television studio automatically through the use of instruction and information signals embedded in programing either supplied from a remote source or sources or prerecorded. The programing may be delivered to the transmission facility by any means including broadcast, hard-wire, and manual means. The transmission facility may transmit a single channel or multiple channels of programing. The method includes a monitoring technique to construct a record for each transmitted channel that duplicates the log that the Federal Communications Commission requires broadcast station operators to maintain. The method permits the transfer of such records to a predetermined site or sites in a predetermined fashion or fashions.~~

~~Another method has application at receiver sites such as private homes or public places like theaters, hotels, brokerage offices, etc., whether commercial establishments or not. This method provides techniques whereby, automatically, single channel, single medium presentations, be they television, radio, or other electronic transmissions, may be recorded, co-ordinated in time with other programing previously transmitted and recorded, or processed in other fashions. Multimedia presentations may be co-ordinated in time and/or in place as, for example, when real-time video programing is co-ordinated with presentations from a microcomputer working with data supplied earlier. This method provides techniques whereby the timing and fashion of the playing, processing, and co-ordination of a presentation or presentations may be determined at the time and place of transmission or of presentation, either in whole or in part, either locally or remotely, or a combination of these factors. The method provides monitoring techniques to develop data on patterns of viewership and to permit the detemination of specific usage at individual receiving sites for various purposes including, for example, the billing of individual customers. The method provides techniques whereby unauthorized use of programing and/or of signals may be prevented.~~

~~These techniques employ signals embedded in programs. The advantage of such embedded signals, as compared to header and trailer signals, is that they cannot become separated inadvertantly from the programing and, thereby, inhibit automatic processing, that they can convey signals to equipment that must switch manners or modes of operation during transmissions of individual units of programing, and that they can be monitored. (The techniques described here may use headers and trailers from time to time.) The embedded signals may run and repeat continuously throughout the programing or they may run only occasionally or only once. They may appear in various and varying locations. In television they may appear on one line in the video portion of the transmission,~~apparatus for communicating programming. The term "programming" refers to everything that is transmitted electronically to entertain, instruct or inform, including television, radio, broadcast print, and computer programming as well as combined medium programming. The system includes capacity for automatically organizing multi-channel communications. Like television, radio, broadcast print, and other electronic media, the present invention has capacity for transmitting to standardized programming that is very simple for subscribers to play and understand. Like computer systems, the present invention has capacity for transmitting data and control instructions in the same information stream to many different apparatus at a given subscriber station, for causing

computers to generate and transmit programming, and for causing receiver apparatus to operate on the basis of programming and information received at widely separated times.

It is the further purpose of this invention to provide means and methods whereby a simplex point-to-multipoint transmission (such as a television or radio broadcast) can cause simultaneous generation of user specific information at a plurality of subscriber stations. One advantage of the present invention is great ease of use. For example, as will be seen, a subscriber can cause his own information to be processed in highly complex ways by merely turning his television receiver on and tuning to a particular channel. Another advantage of the present invention is its so-called "transparency"--subscribers see none of the complex processing taking place. Another advantage is privacy. No private information is required at transmitting stations, and no subscriber's information is available at any other subscriber's station.

It is the further purpose of this invention to provide means and methods whereby a simplex broadcast transmission can cause periodic combining of relevant user specific information and conventional broadcast programming simultaneously at a plurality of subscriber stations, thereby integrating the broadcast information with each user's own information. One advantage of the present invention is its use of powerful communication media such as television to reveal the meaning of the results of complex processing in ways that appear clear and simple. Another advantage is that receiver stations that lack said capacity for combining user specific information into television or radio programming can continue, without modification, to receive and display the conventional television or radio and without the appearance of any signals or change in the conventional programming.

It is the further purpose of this invention to provide means and methods for the automation of intermediate transmission stations that receive and retransmit programming. The programming may be delivered by any means including over-the-air, hard-wire, and manual means. The stations may transmit programming over-the-air (hereinafter, "broadcast") or over hard-wire (hereinafter, "cablecast"). They may transmit single channels or multiple channels. The present invention includes capacity for automatically constructing records for each transmitted channel that duplicate the logs that the Federal Communications Commission requires broadcast station operators to maintain.

It is the further purpose of this invention to provide means and methods for the automation of ultimate receiver stations, especially the automation of combined medium and multi-channel presentations. Such ultimate receiver stations may be private homes or offices or commercial establishments such as theaters, hotels, or brokerage offices.

It is further purpose of this invention to provide means and methods for identifying and recording what television, radio, data, and other programming is transmitted at each transmission station, what programming is received at each receiver station, and how programming is used. In the present invention, certain monitored signals may be encrypted, and certain data collected from such monitoring may be automatically transferred from subscriber stations to one or more remote geographic stations.

It is a further purpose of this invention to provide means and methods

for recording combined media and/or multi-channel programming and for playing back prerecorded programming of such types.

It is a further purpose of this invention to provide a variety of means and methods for restricting the use of transmitted communications to only duly authorized subscribers. Such means and methods include techniques for encrypting programming and/or instructions and decrypting them at subscriber stations. They also include techniques whereby the pattern of the composition, timing, and location of embedded signals may vary in such fashions that only receiving apparatus that are preinformed regarding the patterns that obtain at any given time will be able to process the signals correctly.

The present invention employs signals embedded in programming. Embedded signals provide several advantages. They cannot become separated inadvertently from the programming and, thereby, inhibit automatic processing. They occur at precise times in programming and can synchronize the operation of receiver station apparatus to the timing of programming transmissions. They can be conveniently monitored.

In the present invention, the embedded signals contain digital information that may include addresses of specific receiver apparatus controlled by the signals and instructions that identify particular functions the signals cause addressed apparatus to perform.

In programming transmissions, given signals may run and repeat, for periods of time, continuously or at regular intervals. Or they may run only occasionally or only once. They may appear in various and varying locations. In television they may appear on one line in the video portion of the transmission such as line 20 of the vertical interval, or on a portion of one line, or on more than one line, and they will probably lie outside the range of the television picture displayed on a normally tuned television set. In television and radio they may appear in a portion of the audio range that is not normally rendered in a form audible to the human ear. In television audio, they are likely to lie between eight and fifteen kilohertz. ~~Signals may also be transmitted on frequencies outside~~In broadcast print and data communications ~~the ranges of television and radio. Different and differing numbers of signals may be sent in different and differing word lengths and locations.~~

~~The present invention provides a method for obscuring the meaning of the signals to prevent unauthorized use of the signals and of their associated programing. Their meanings may be obscured through encryption so that apparatus described below are necessary to decrypt them. In addition, the pattern of the composition, timing, and location of the signals may vary in such ways that only receiving apparatus that are preinformed regarding the patterns that obtain at any given time will be able to process the signals correctly. Both the arrangement of signal units in signal words and the locations, timings, and lengths of signal words in individual transmissions or groups of transmissions may vary in fashions that can only be interpreted accurately by apparatus that are preprogramed with the keys to such variations.~~

~~The present invention also provides a method for identifying attempts to make unauthorized use of signals and the programing associated with signals. When an apparatus finds that signal words fail to appear in~~

~~places and at times when and where they are expected, the apparatus may automatically contact one or more remote sites and may or may not disable the flow of programing in one or more ways.~~transmissions, the signals may accompany conventional print or data programming in the conventional transmission stream but will include instructions that receiver station apparatus are preprogrammed to process that instruct receiver apparatus to separate the signals from the conventional programming and process them differently. In all cases, signals may convey information in discrete words, transmitted at separate times or in separate locations, that receiver apparatus must assemble in order to receive one complete instruction.

(The term "signal unit" hereinafter means one complete signal instruction or information message unit. Examples of signal units are a unique code identifying a programming unit, or a unique purchase order number identifying the proper use of a programming unit, or a general instruction identifying whether a programming unit is to be retransmitted immediately or recorded for delayed transmission. The term "signal word" hereinafter means one full discrete appearance of a signal as embedded at one time in one location on a transmission. Examples of signal words are a string of one or more digital data bits encoded together on a single line of video or sequentially in audio. Such strings may or may not have predetermined data bits to identify the beginnings and ends of words. Signal words may contain parts of signal units, whole signal units, or groups of partial or whole signal units or combinations.)

~~The present invention contemplates~~In the present invention, particular signal processing apparatus (hereinafter called the "signal processor") detect signals and, in accordance with instructions in the signals and preprogramming in the signal processor, decrypt and/or record and/or control station apparatus by means of the signals and/or discard the signals. The apparatus include ~~comprising a device or~~one or more devices that can selectively scan transmission frequencies as directed and, separately, capacity to receive signals from one or more devices that continuously monitor selected frequencies. The frequencies ~~channels as directed. The channels~~ may convey television, radio, or other programming transmissions. The ~~transmission frequencies. The~~ input transmissions may be received ~~by~~ by means of antennas or ~~from~~ from hard-wire connections. The ~~scanners/switches,~~ scanners/switches, working in parallel ~~or~~ or series or combinations, transfer the transmissions to ~~to~~ receiver/decoder/detectors that identify signals encoded in programming transmissions and convert the encoded signals to digital information; decryptors that may convert the received information, in part or in whole, to other digital information according to preset methods or patterns; and one or more processor/monitors and/or buffer/comparators that organize and transfer the information stream. The processors and buffers can have inputs from each of the receiver/detector lines and evaluate information continuously. From the processors and buffers, the signals may be transferred to external equipment such as computers, videotape recorders and players, etc. And/or they may be transferred to one or more internal digital recorders that receive and store in memory the recorded information and have connections to one or more remote sites for further transmission of the recorded information. The apparatus has means for external communication and an automatic dialer and can contact

remote sites and transfer stored information as required in a predetermined fashion or fashions. The apparatus has a clock for determining and recording time as required. It has a read only memory for recording permanent operating instructions and other information and a programmable random access memory controller ("PRAM controller") that permits revision of operating patterns and instructions. The PRAM controller may be connected to all internal operating units for full flexibility of operations.

Signal processing apparatus that are employed in specific situations that require fewer functions than those provided by the ~~basic apparatus~~signal processor
described above may omit one or more of the specific operating elements described above.

A central objective of the present invention is to provide flexibility in regard to installed station apparatus. At any given time, the system must have capacity for wide variation in individual station apparatus in order to provide individual subscribers the widest range of information options at the least cost in terms of installed equipment. Flexibility must exist for expanding the capacity of installed systems by means of transmitted software and for altering installed systems in a modular fashion by adding or removing components. Flexibility must exist for varying techniques that restrict programming to duly authorized subscribers in order to identify and deter pirates of programming.

Other objects, features, and advantages of this invention will appear in the following descriptions and the appended claims.

DRAWING DESC:

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a block diagram of a video/computer combined medium receiver station.

FIG. 1A shows a representative example of a computer generated, user specific graphic as it would appear by itself on the face of a display tube.

FIG. 1B shows a representative example of a studio generated graphic displayed on the face of a display tube.

FIG. 1C shows a representative example, on the face of a display tube, of a studio graphic combined with a user specific graphic.

FIG. 2 is a block diagram of one embodiment of ~~signal processing~~ a signal processor.

~~apparatus.~~

FIG. 2A is a block diagram of a TV signal decoder apparatus.

FIG. 2B is a block diagram of a radio signal decoder apparatus.

FIG. 2C is a block diagram of an other signal decoder apparatus.

~~FIGS. 3A 3B and 3C are~~FIG. 2D is a block diagram of one embodiment of a receiver station signal processing system.

FIG. 2E illustrates one example of the composition of signal information and shows the initial binary information of a message that contains execution, meter-monitor, and information segments.

FIG. 2F shows one instance of a meter-monitor segment.

FIG. 2G shows one instance of a command that fills a whole number of byte signal words incompletely.

FIG. 2H shows one instance of a message that contains execution and meter-monitor segments and consists of the command of FIG. 2G with three padding bits added at the end to complete the last byte signal word.

FIG. 2I shows one instance of a SPAM message stream.

FIG. 2J shows one instance of a message that consists of just a header and an execution segment and fills one byte signal word completely.

FIG. 2H shows one instance of a message that contains execution and meter-monitor segments and fills a whole number of byte signal words completely but ends with one full byte signal word of padding bits because the last byte signal word of command information is an EOFS word.

FIG. 3 is a block diagram of a video/computer combined medium receiver station with a signal processing system.

FIG. 3A is a block diagram of the preferred embodiment the controller apparatus of a SPAM decoder.

FIG. 4 is a block diagram of one example of a signal processing programming reception and use regulating system.

FIG. 5 is a block diagram of one example of a signal processing apparatus and methods monitoring system installed to monitor a subscriber station.

FIG. 6 is a block diagram of one example of signal processing apparatus and methods ~~as they might be used in~~at an intermediate~~transmission facility,~~transmission station, in this case a ~~cable system head end.~~ -cable

~~FIG. 4A is a block diagram of a signal processor and a programing decryptor or other interrupt means with signals input to the signal processor before programing decryption. Also included is a local input.~~

~~FIG. 4B is a block diagram of a signal processor and a decryptor/interruptor with signals input to the signal processor in programing after programing decryption.~~

~~FIG. 4C is a block diagram of a signal processor and a decryptor/interruptor with signals input both before and after programing decryption.~~

~~FIG. 4D is a block diagram of a signal processor and a multiple decrypter/interrupters in series, with signals input both before and after programing decryption.~~

~~FIG. 4E is a block diagram of a signal processor and multiple decryptor/interruptors and with signals from one channel needed for decryption of a second channel.~~

~~FIG. 5 is a block diagram of signal processor apparatus monitoring various programing and viewership patterns.~~

~~FIG. 6A is a block diagram of signal processor apparatus and methods used to instruct and inform external equipment governing the environment of the local receiver site.~~

~~FIG. 6B is a block diagram of signal processor apparatus and methods~~ system headend.

FIG. 7 is a block diagram of signal processing apparatus and methods at an ultimate receiver station.

FIG. 7A is a block diagram of signal processing apparatus and methods with external equipment regulating the environment of the local receiver site.

FIG. 7B is a block diagram of signal processing apparatus and methods used to ~~co-ordinate a multi-media,~~control a combined medium, multi-channel presentation and ~~monitor~~to monitor such viewership.

FIG. ~~6C~~7C is a block diagram of signal ~~processor~~processing apparatus and methods ~~used to organize the reception of selected~~selecting receivable information and ~~programing and~~programming and controlling combined ~~to co-ordinate multi-media, multi-channel presentations in time.~~medium, multi-channel presentations.

FIG. ~~6D~~7D is a block diagram of ~~another example of multi-media,~~a radio/computer combined medium receiver ~~multi-channel co-ordination. In this case, the co-ordintation of video and print.~~

~~FIG. 6E is a block diagram of signal processing techniques co-ordinated~~ station.

FIG. 7E is a block diagram of a television/computer combined medium receiver station.

FIG. 7F is a block diagram of an example of controlling television and print combined media.

FIG. 8 is a block diagram of selected apparatus of the station of FIG. 7 with a station specific EPROM, 20B, installed. ~~with programing decryptions techniques to facilitate electronic distribution of copyrighted materials while discouraging pirating and unauthorized copying.~~

~~FIGS. 6F and 6G comprise a block diagram of signal processor apparatus and methods as they might be used at a consumer receiver site.~~

~~FIG. 6H shows the relationship of FIGS. 3A, 3B, and 3C.~~

~~FIG. 6J shows the relationship of FIGS. 6F and 6G.~~

DETDESC:

DESCRIPTION OF THE PREFERRED EMBODIMENTS

ONE COMBINED MEDIUM

FIG. 1 shows a video/computer combined medium subscriber station. Via ~~The Signal Processor Apparatus~~

~~A signal processor apparatus for simultaneous use with a cablecast input that conveys both television and radio programing and a broadcast television input is shown in FIG. 1. As shown, the input signals are the entire range of frequencies or channels transmitted on the cable and the entire range of broadcast television transmissions available to a local television antenna of conventional design. The cable transmission is input simultaneously to switch 1 and mixer 2. The broadcast transmission is input to switch 1. Switch 1 and mixers 2 and 3 are all controlled by local oscillator and switch control 6. The oscillator, 6, is controlled to provide a number of discrete specified frequencies for the particular radio and television channels required. The switch, 1, acts to select the broadcast input or the cablecast input and passes transmissions to mixer 3 which, with the controlled oscillator, 6, acts to select a television frequency of interest that is passed at a fixed frequency to a TV signal decoder, 30.~~

~~Decoder 30 is shown more fully in FIG. 2A. In the decoder, 30, the frequency passes first through filter 31 which defines the particular channel of interest to be analyzed. The television channel signal is then transmitted to a standard amplitude demodulator, 32, which uses standard demodulator techniques well known in the art to define the television base band signal. This base band signal is then transmitted through separate paths to three separate detector devices. These separate detectors are designed to act on the particular frequency ranges in which the encoded information may be found. The first path, designated A, inputs to a standard line receiver, 33, well known in the art. This line receiver, 33, detects the existance of an embedded signal or signals in one or more of the lines normally used to define a television picture. It receives and detects only that portion or portions of the overall video transmission and passes this line portion or portions to a digital detector, 34, which acts to decode the encoded signal information in the line portion or portions. The base band signal is also inputted through path B to an audio demodulator, 35, which further inputs a high pass filter, 36, and a digital detector, 37. The digital detector, 37, through standard detection techniques well known in the art, determines whether a particular signal is present in the transmission in a predetermined fashion. Path C inputs the separately defined transmission to a digital detector, 38. Detectors, 34, 37, and 38, line receiver, 33, and high pass filter, 36, all operate in predetermined fashions which fashions may be changed by external controller, 20 (referring to FIG. 1), to be described below.~~

~~If one returns to FIG. 1, one sees that the three separate lines of information outputted from TV signal decoder, 30, are then gated to a buffer/comparator, 8, which also receives other inputs from the other separate receivers comprising similar filters, demodulators, and decoders for other channels of interest.~~

~~One such other path is that from mixer 2. Mixer 2 and the controlled oscillator, 6, act to select a radio frequency of interest which is inputted to a radio signal decoder, 40, shown in FIG. 2B. The frequency passes first through standard radio receiver circuitry, 41, well known in the art, a radio decoder, 42, and a standard digital detector, 43. All operate in predetermined fashions that may be changed by external controller, 20 (referring to FIG. 1). As FIG. 1 shows, the radio signal detector outputs to buffer/comparator 8.~~

~~(The signal processor apparatus described here is configured to receive broadcast TV transmissions and cablecast TV and radio transmissions. Were it desirable to process signals in other transmissions such as broadcast microwave transmissions or cablecast transmissions on other than standard TV and radio frequencies, the mixers and switches would be appropriately reconfigured and one or more other signal decoders as described in FIG. 2C would be added. As FIG. 2C shows, the desired frequencies would pass through appropriate other receiver circuitry, 45, well known in the art, and an appropriate digital detector, 46, before being outputted to buffer/comparator 8. These, too, can be controlled by controller, 20 (referring to FIG. 1).)~~

~~Buffer/comparator, 8, organizes the data stream that it receives according to a pre-determined fashion that enables buffer/comparator, 8, among other things, to assemble signal units from signal words. In a pre-determined fashion, buffer/comparator, 8, identifies signal words and/or signal units that must be decrypted, either in whole or in part, and passes identified signal words and/or units to decrypter, 10. Decrypter, 10, uses conventional decrypter techniques, well known in the art, in a pre-determined fashion to decrypt such signals as required. Decrypter, 10, then passes the decrypted signals to processor or monitor, 12. Buffer/comparator, 8, passes signal words and units not identified as requiring decryption directly to processor or monitor, 12.~~

~~Processor or monitor, 12, analyzes, in a pre-determined fashion, the signal words and units that it receives and determines whether they are to be passed to external equipment or to buffer/comparator, 14, for further processing or both. If a signal or signals are to be passed externally, processor unit, 12, identifies, in a pre-determined fashion, the external equipment to which the signal or signals are addressed and passes them to appropriate jack ports for external transmission. If they are to be processed further, processor or monitor, 12, passes them to buffer/comparator, 14. Processor or monitor, 12, communicates with clock, 18, and has means to delay the transfer of signals, in a predetermined fashion, when delayed transfer is determined, in a predetermined fashion, to be required.~~

~~Buffer/comparator, 14, has means for identifying, according to a predetermined fashion, which signals are to be recorded. To avoid overloading digital recorder, 16, with duplicate data, buffer/comparator, 14, has means for counting and discarding duplicate signals.~~

~~Buffer/comparator, 14, is connected to clock, 18, and has means for adding information such as time of receipt, for example, to signals. Upon determining in a pre-determined fashion that a signal word or unit should be passed, buffer/comparator, 14, transmits the combined information to a digital recorder, 16. Buffer/comparator, 14, also has means for determining, in a predetermined fashion, when signals require transfer immediately to a remote site and for communicating such a requirement to controller, 20, and such signals directly with the remote site via telephone connection, 22.~~

~~Digital recorder, 16, may be a memory storage element of standard design. It has means for determining in a predetermined fashion how full it is and passing this information to controller, 20. The pre-determined fashion may include provisions whereby recorder, 16, informs controller, 20, automatically when it reaches a certain level of fullness.~~

~~The signal processor apparatus also has a controller device which includes programable random access memory controller 20, read only memory 21 that may contain a unique digital code capable of identifying the signal processing apparatus uniquely, an automatic dialing device 24, and a telephone unit, 22. The controller, 20, governs the operation of all operating elements of the apparatus. The controller, 20, inputs the local oscillator, 6, a sequential pattern to select the various channels to be received by switch, 1, and mixers, 2 and 3. This then allows the channels to be diverted to the detectors, receivers, and decoders in any predetermined pattern desired. The controller, 20, can instruct signal decoders, 30 and 40, when, where, and how to look for signal words, which allows signal words to be received in any pattern or patterns. It can instruct buffer/comparator, 8, how to assemble signal words into signal units and join units together for further transfer and how to determine which signals to pass to decrypter, 10. It can tell decrypter, 10, when and how to change decryption patterns, fashions, and techniques. It can tell processor or monitor, 12, how to determine which signals to pass externally and when and where and how to determine which signals to pass to buffer/comparator, 14. It can tell buffer/comparator, 14, what and how to count, what and how to mark signals, and what received signals to discard. The controller, 20, also inputs the digital recorder, 16, to direct it to output the information from the memory of the recorder, 16, to telephone connection, 22, and thence to the collection site at the remote geographical location. The controller, 20, also controls the automatic telephone dialing device, 24, to allow the apparatus to automatically output its own information in accordance with a predetermined sequence and to change telephone numbers dialed as required.~~

~~To facilitate the operation of the device, the controller, 20, can receive information from all operating elements of the apparatus. Control signals can be passed to the apparatus by means of the programing transmissions input at switch, 1, and mixer, 2. An example of such a control signal is an instruction for the apparatus to contact a remote telephone unit. The processor unit, 12, has the capacity to identify instruction signals for controller, 20, and pass them to controller, 20, over control information lines. Buffer/comparator, 14, has the capacity to pass received time signals to the controller, 20, in a predetermined~~conventional antenna, the station receives a conventional television
broadcast transmission at television tuner, 215. The Model CV510

Electronic TV Tuner of the Zenith Radio Corporation of Chicago, Ill., which is a component of the Zenith Video Hi-Tech Component TV system, is one such tuner. This tuner outputs conventional audio and composite video transmissions. The audio transmission is inputted to TV monitor, 202M. The video transmission is inputted to video transmission divider, 4, which is a conventional divider that splits the transmission into two paths. One is inputted continuously to TV signal decoder, 203, and the other to microcomputer, 205. TV signal decoder, 203, which is described more fully below, has capacity for receiving a composite video transmission; detecting digital information embedded therein; correcting errors in the received information by means of forward error checking techniques, well known in the art; converting the received information, as may be required, by means of input protocol techniques, well known in the art, into digital signals that microcomputer, 205, can receive and process and that can control the operation of microcomputer, 205; and transferring said signals to microcomputer, 205. Microcomputer, 205, is a conventional microcomputer system with disk drives that is adapted to have capacity for receiving signals from decoder, 203; for generating computer graphic information; for receiving a composite video transmission; for combining said graphic information onto the video information of said transmission by graphic overlay techniques, well known in the art; and for outputting the resulting combined information to a TV monitor, 202M, in a composite video transmission. One such system is the IBM Personal Computer of International Business Machines Corporation of Armonk, N.Y. with an IBM Asynchronous Communications Adapter installed in one expansion slot and a PC-MicroKey Model 1300 System with Techmar Graphics Master Card, as supplied together by Video Associates Labs of Austin, Tex., installed in two other slots. Microcomputer, 205, receives digital signals from decoder, 203, at its asynchronous communications adapter and the video transmission from divider, 4, at its PC-MicroKey 1300 System. It outputs the composite video transmission at its PC-MicroKey System. Microcomputer, 205, has all required operating system capacity--e.g., the MS/DOS Version 2.0 Disk Operating System of Microsoft, Inc. of Bellvue, Wash. with installed device drivers. TV monitor, 202M, has capacity for receiving composite video and audio transmissions and for presenting a conventional television video image and audio sound. One such monitor is the Model CV1950 Color Monitor of the Zenith Radio Corporation.

In the example, the subscriber station of FIG. 1 is in New York City and is tuned to the conventional broadcast television transmission frequency of channel 13 at 8:30 PM on a Friday evening when the broadcast station of said frequency, WNET, commences transmitting a television program about stock market investing, "Wall Street Week." Said WNET station is an intermediate transmission station for said program which actually originates at a remote television studio in Owings Mills, Md. (Hereinafter, a studio or station that originates the broadcast transmission of programming is called the "program originating studio.") From said program originating studio said program is transmitted by conventional television network feed transmission means, well known in the art, to a large number of geographically dispersed intermediate transmission stations that retransmit said program to millions of subscriber stations where subscribers view said program. Said network transmission means may include so-called landlines, microwave transmissions, a satellite transponder, or other means.

At said subscriber station, microprocessor, 205, contains a conventional

51/4" floppy disk at a designated one of its disk drives that holds a data file recorded in a fashion well known in the art. Said file contains information on the portfolio of financial instruments owned by the subscriber that identifies the particular stocks in the portfolio, the number of shares of each stock owned at the close of business of each business day from the end of the previous week, and the closing share prices applicable each day. Decoder, 203, is preprogrammed to detect digital information on a particular line or lines (such as line 20) of the vertical interval of its video transmission input; to correct errors in said information; to convert said corrected information into digital signals usable by microcomputer, 205; and to input said signals to microcomputer, 205, at its asynchronous communications adapter. Microcomputer, 205, is preprogrammed to receive said input of signals at its asynchronous communications adapter and to respond in a predetermined fashion to instruction signals embedded in the "Wall Street Week" programming transmission.

Other similarly configured and preprogrammed subscriber stations also tune to the transmission of said "Wall Street Week" program by given intermediate transmission stations. At each subscriber station, the records in the contained financial portfolio file hold, in identical format, information on the particular investments of that station's subscriber.

At the start of the transmission of said "Wall Street Week" program, all subscriber station apparatus is on and fully operational.

At said program originating studio, at the outset of said program transmission, a first series of control instructions is generated, embedded sequentially on said line or lines of the vertical interval, and transmitted on the first and each successive frame of said television program transmission, signal unit by signal unit and word by word, until said series has been transmitted in full. The instructions of said series are addressed to and control the microcomputer, 205, of each subscriber station.

In said series in full--and in any one or more subsequent series of instructions--particular instructions are separated, as may be required, by time periods when no instruction that controls the microcomputer, 205, of any station is transmitted which periods allow sufficient time for the microcomputer, 205, of each and every subscriber station to complete functions controlled by previously transmitted instructions and commence waiting for a subsequent instruction, in a waiting fashion well known in the art, before receiving a subsequent instruction.

Tuner, 215, receives this television transmission, converts the received television information into audio and composite video transmissions, and transmits the audio to monitor, 202M, and the video via divider, 4, to microcomputer, 205, and decoder, 203. Decoder, 203, detects the embedded instruction information, corrects it as required, converts it into digital signals usable by microcomputer, 205, and transmits said signals to microcomputer, 205.

With each step occurring in a predetermined fashion or fashions, well known in the art, this first set of instructions commands microcomputer, 205, (and all other subscriber station microcomputers simultaneously) to interrupt the operation of its central processor unit (hereinafter,

"CPU") and any designated other processors; then to record the contents of the registers of its CPU and any other designated processors either at a designated place in random access memory (hereinafter, "RAM") or on the contained disk; then to set its PC-MicroKey 1300 to the "GRAPHICS OFF" operating mode in which mode it transmits all received composite video information to monitor, 202M, without modification; then to record all information in RAM with all register information in an appropriately named file such as "INTERUPT.BAK" at a designated place on the contained disk; then to clear all RAM (except for that portion of RAM containing the so-called "operating system" of said microcomputer, 205) and all registers of said CPU and any other designated processors; then to wait for further instructions from decoder, 203.

Operating in said preprogrammed fashion under control of said first set of instructions, microcomputer, 205, reaches a stage at which the subscriber can input information only under control of signals embedded in the broadcast transmission and can reassume control of microcomputer, 205, (so long as microcomputer, 205, remains on and continues, in a predetermined fashion, to receive said embedded transmitted signals) only by executing a system reset (or so-called "warm boot") which on an IBM PC is accomplished by depressing simultaneously the "Ctrl", "Alt" and "Del" keys on the console keyboard.

(Hereinafter, this first set of instructions is called the "control invoking instructions," and the associated steps are called "invoking broadcast control.")

After completing all steps of invoking broadcast control, the microcomputer at each subscriber station (including microcomputer, 205) is preprogrammed (1) to evaluate particular initial instructions in each distinct series of received input instructions to ascertain how to process the information of said series and (2) to operate in a predetermined fashion or fashions in response to said initial instructions.

Subsequently, a second series of instructions is embedded and transmitted at said program originating studio. Said second series is detected and converted into usable digital signals by decoder, 203, and inputted to microcomputer, 205, in the same fashion as the first series. Microcomputer, 205, evaluates the initial signal word or words which instruct it to load at RAM (from the input buffer to which decoder, 203, inputs) and run the information of a particular set of instructions that follows said word or words just as the information of a file named FILE.EXE, recorded on the contained floppy disk, would be loaded at RAM (from the input buffer to which the disk drive of said disk inputs) and run were the command "FILE" entered from the console keyboard to the system level of the installed disk operating system. (Hereinafter, such a set of instructions that is loaded and run is called a "program instruction set.") In a fashion well known in the art, microcomputer, 205, loads the received binary information of said set at a designated place in RAM until, in a predetermined fashion, it detects the end of said set, and it executes said set as an assembled, machine language program in a fashion well known in the art.

Under control of said program instruction set and accessing the subscriber's contained portfolio data file for information in a fashion well known in the art, microcomputer, 205, calculates the performance of

the subscriber's stock portfolio and constructs a graphic image of that performance at the installed graphics card. The instructions cause the computer, first, to determine the aggregate value of the portfolio at each day's close of business by accumulating, for each day, the sum of the products of the number of shares of each stock held times that stock's closing price. The instructions then cause microcomputer, 205, to calculate the percentage change in the portfolio's aggregate value for each business day of the week in respect to the final business day of the prior week. Then in a fashion well known in the art, the instructions cause microcomputer, 205, to enter digital bit information at the video RAM of the graphics card in a particular pattern that depicts the said percentage change as it would be graphed on a particular graph with a particular origin and set of scaled graph axes. Upon completion of these steps, the instructions cause microcomputer, 205, to commence waiting for a subsequent instruction from decoder, 203.

If the information at video RAM at the end of these steps were to be transmitted alone to the video screen of a TV monitor, it would appear as a line of a designated color, such as red, on a background color that is transparent when overlaid on a separate video image. Black is such a background color, and FIG. 1A shows one such line.

As each subscriber station completes the steps of calculation and graphic imaging performed under control of said program instruction set, information of such a line exists at video RAM at said station which information reflects the specific portfolio performance of the user of said station. Said information results from much computation, but the meaning of said information is hardly clear. FIG. 1A shows just a line.

While microcomputer, 205, performs these steps, TV monitor, 202M, displays the conventional television image and the sound of the transmitted "Wall Street Week" program. During this time the program may show the so-called "talking head" of the host as he describes the behavior of the stock market over the course of the week. Then the host says, "Now as we turn to the graphs, here is what the Dow Jones Industrials did in the week just past," and a studio generated graphic is transmitted. FIG. 1B shows the image of said graphic as it appears on the video screen of TV monitor, 202M. Then the host says, "And here is what your portfolio did." At this point, an instruction signal is generated at said program originating studio, embedded in the programming transmission, and transmitted. Said signal is identified by decoder, 203; transferred to microcomputer, 205; and executed by microcomputer, 205, at the system level as the statement, "GRAPHICS ON". Said signal instructs microcomputer, 205, at the PC-MicroKey 1300 to overlay the graphic information in its graphics card onto the received composite video information and transmit the combined information to TV monitor, 202M. TV monitor, 202M, then displays the image shown in FIG. 1C which is the microcomputer generated graphic of the subscriber's own portfolio performance overlaid on the studio generated graphic. And microcomputer, 205, commences waiting for another instruction from decoder, 203.

By itself, the meaning of FIG. 1A is hardly clear. But when FIG. 1A is combined and displayed at the proper time with the conventional television information, its meaning becomes readily apparent. Simultaneously, each subscriber in a large audience of subscribers sees his own specific performance information as it relates to the performance information of the market as a whole.

(Hereinafter, an instruction such as the above signal of "GRAPHICS ON" that causes subscriber station apparatus to execute a combining operation in synchronization is called a "combining synch command." Said initial signal word or words that preceded the above program instruction set provide another example of a combining synch command in that said word or words synchronized all subscriber station computers in commencing loading and running information for a particular combining.)

While the TV monitor at this particular subscriber station displays this particular subscriber's own overlay information, each other subscriber station displays the specific overlay information applicable at that station.

As the program proceeds, in the same fashion a further instruction signal is generated at said studio; transmitted; detected; inputted from decoder, 203, to microcomputer, 205; and executed as "GRAPHICS OFF." Then said studio ceases transmitting the graphic image, and transmits another image such as the host's talking head. Simultaneously, the GRAPHICS OFF command causes microcomputer, 205, to cease overlaying the graphic information onto the received composite video and to commence transmitting the received composite video transmission unmodified. Thereafter the "Wall Street Week" program proceeds, and microcomputer, 205, continues to operate under control of received instructions.

This combined medium example is of a television based medium. Like conventional television, said combined medium transmits the same signals to all subscriber stations. But unlike conventional television where each subscriber views only programming viewed by every other subscriber and where said programming is known to and available at the program originating studio, each subscriber of said combined medium views programming that is personalized and private. The programming he views is his own--in the example, his own portfolio performance--and his programming is not viewed by any other subscriber nor is it available at the program originating studio. In addition, personalized programming is displayed only when it is of specific relevance to the conventional television programming of said combined medium. In the example, each subscriber views a graphic presentation of his own portfolio performance information as soon as it becomes specifically relevant to graphic information of the performance of the market as a whole. Prior to its time of specific relevance, no personalized information is displayed (despite the fact that said graphic information of the performance of the market as a whole is displayed). And said personalized information is displayed only for so long as it remains specifically relevant. As soon as its specific relevance terminates, its display terminates.

This "Wall Street Week" portfolio performance example provides but one of many examples of television based combined medium programming.

This television based combined medium is but one example of many combined media.

The Signal Processor

In the present invention, the signal processor--26 in FIG. 2; 26 in the signal processor system of FIG. 2D; in the signal processor system, 71, of FIG. 6; 200 in FIG. 7; and elsewhere--is focal means for the

controlling and monitoring subscriber station operations. It meters communications and enables owners of information to offer their information to subscribers in many fashions on condition of payment. It has capacity for regulating communications consumption by selectively decrypting or not decrypting encrypted programming and/or control signals and capacity for assembling and retaining meter records at each subscriber station that document the consumption of specific programming and information at said station. It has capacity for identifying the subject matter of each specific unit of programming available on each of many transmission channels at each subscriber station as said unit becomes available for use and/or viewing which enables subscriber station apparatus to determine automatically whether the subject matter of said unit is of interest and, if so, to tune automatically to said programming. It has capacity, at each station, for receiving monitor information that identifies what programming is available, what programming is used, and how said programming is used and capacity for assembling and retaining monitor records that document said availability and usage. It has capacity for transferring said meter records automatically to one or more remote automated billing stations that account for programming and information consumption and bill subscribers and said monitor records automatically to one or more remote so-called "ratings" stations that collect statistical data on programming availability and usage. It has capacities for processing information in many other fashions that will become apparent in this full specification.

FIG. 2 shows one embodiment of a signal processor. Said processor, 26, is configured for simultaneous use with a cablecast input that conveys both television and radio programming and a broadcast television input.

At switch, 1, and mixers, 2 and 3, signal processor, 26, monitors all frequencies or channels available for reception at the subscriber station of FIG. 2 to identify available programming. The inputted information is the entire range of frequencies or channels transmitted on the cable and the entire range of broadcast television transmissions available to a local television antenna of conventional design. The cable transmission is inputted simultaneously to switch, 1, and mixer, 2. The broadcast transmission is inputted to switch, 1. Switch, 1, and mixers, 2 and 3, are all controlled by local oscillator and switch control, 6. The oscillator, 6, is controlled to provide a number of discrete specified frequencies for the particular radio and television channels required. The switch, 1, acts to select the broadcast input or the cablecast input and passes transmissions to mixer, 3, which, with the controlled oscillator, 6, acts to select a television frequency of interest that is passed at a fixed frequency to a TV signal decoder, 30. Simultaneously, mixer, 2, and the controlled oscillator, 6, act to select a radio frequency of interest which is inputted to a radio signal decoder, 40.

At decoders, 30 and 40, signal processor, 26, identifies specific programming and its subject matter as said programming becomes available for use and/or viewing. Decoder, 30, which is shown in detail in FIG. 2A, and decoder, 40, which is shown in FIG. 2B, detect signal information embedded in the respective inputted television and radio frequencies, render said information into digital signals that subscriber station apparatus can process, modify particular ones of said signals through the addition and/or deletion of particular information, and output said signals and said modified signals to buffer/comparator, 8. Said decoders are considered more fully below.

Buffer/comparator, 8, receives said signals from said decoders and other signals from other inputs and organizes the received information in a predetermined fashion. Buffer/comparator, 8, has capacity for comparing a particular portions or portions of inputted information to particular preprogrammed information and for operating in preprogrammed fashions on the basis of the results of said comparing. It has capacity for detecting particular end of file signals in inputted information and for operating in preprogrammed fashions whenever said information is detected.

The process of communication metering commences at buffer/comparator, 8. In a predetermined fashion, buffer/comparator, 8, determines whether a given instance of received signal information requires decryption, either in whole or in part. In a fashion described more fully below, buffer/comparator, 8, and a controller, 20, which, too, is described more fully below, determine whether signal processor, 26, is enabled to decrypt said information. If signal processor, 26, is so enabled, buffer/comparator, 8, transfers said information to decryptor, 10. If signal processor, 26, is not so enabled, buffer/comparator, 8, discards ~~fashion set by and changeable by controller, 20.~~said information in a predetermined fashion. Buffer/comparator, 8, ~~and monitor or processor, 12, each have the capacity to inform controller, 20, when signals that they are instructed to look for in predetermined fashions, set by and changeable by controller, 20, fail to appear. Oscillator, 6, the controller, 20, and buffer/comparator, 8, can interact in such a fashion that buffer, 8, can identify the channel that any given signal is received on and mark the signal for subsequent identification of the channel. Digital recorder, 16, can tell the controller, 20, when it reaches predetermined levels of fullness to permit the controller, 20, to instruct auto dialer, 24, to contact an appropriate remote site allowing the recorder, 16, to output its data making memory available. In normal operation, controller, 20, may be instructed by the remote site to erase recorder, 16, which instruction controller, 20, effects through communication with recorder, 16; however,~~transfers signals that do not require decryption directly to processor or controller, 12.

Decryptor, 10, is a standard digital information decryptor, well known in the art, that receives signals from buffer/comparator, 8, and under control of said controller, 20, uses conventional decryptor techniques, well known in the art, to decrypt said signals as required. Decryptor, 10, transfers decrypted signals to controller, 12.

Controller, 12, is a standard controller, well known in the art, that has microprocessor and RAM capacities and one or more ports for transmitting information to external apparatus. Said microprocessor capacity of controller, 12, is of a conventional type, well known in the art, but is specifically designed to have particular register memories, discussed more fully below. Controller, 12, may contain read only memory (hereinafter, "ROM").

Controller, 12, receives the signals inputted from buffer/comparator, 8, and decryptor, 10; analyzes said signals in a predetermined fashion; and determines whether they are to be transferred to external equipment or to buffer/comparator, 14, or both. If a signal or signals are to be transferred externally, in a predetermined fashion controller, 12,

identifies the external apparatus to which the signal or signals are addressed and transfers them to the appropriate port or ports for external transmission. If they contain meter and/or monitor information and are to be processed further, controller, 12, selects, assembles, and transfers the appropriate information to buffer/comparator, 14. Controller, 12, has capacity to modify received signals by adding and/or deleting information and can transfer a given signal to one apparatus with one modification and to another apparatus with another modification (or with no modification). Controller, 12, receives time information from clock, 18, and has means to delay in a predetermined fashion the transfer ~~controller may ignore such an instruction~~of signals when, in a predetermined fashion, ~~if~~delayed transfer is
~~the information in recorder, 16, is to be conveyed to more than one remote sites.~~

~~The controller, 20, can shut off any element or elements of the apparatus in whole or in part. It is interactive with external sources~~determined to be required.

Buffer/comparator, 14, receives signal information that is meter information and/or monitor information from controller, 12, and from other inputs; organizes said received information into meter records and/or monitor records (called, in aggregate, hereinafter, "signal records") in a predetermined fashion or fashions; and transmits said signal records to a digital recorder, 16, and/or to one or more remote sites. With respect to particular simple or frequently repeated instances of signal information, buffer/comparator, 8, has capacity to determine, in a predetermined fashion or fashions, what received information should be recorded, how it should be recorded, and when it should be transmitted to recorder, 16, and/or to said remote sites and to initiate or modify signal records and to discard unnecessary information accordingly. To avoid overloading digital recorder, 16, with duplicate data, buffer/comparator, 14, has means for counting and/or discarding duplicate instances of particular signal information and for incorporating count information into signal records. Buffer/comparator, 14, receives time information from clock, 18, and has means for incorporating time information into signal records. Buffer/comparator, 14, also has means for transferring received information immediately to a remote site or sites via telephone connection, 22, and ~~can be reprogramed from such remote~~for communicating a requirement
for such transfer to controller, 20, which causes such transfer. Buffer/comparator, 14, operates under control of controller, 20, and has capacity whereby controller, 20, can cause modification of the formats of and information in signal records at buffer/comparator, 14. (In circumstances where information collecting and processing functions are extensive-- for example, when a given buffer/comparator, 14, must collect monitor information at a subscriber station with apparatus and/or communications flows that are extensive and complex--buffer/comparator, 14, may operate under control of a dedicated, so-called "on-board" controller, 14A, at buffer/comparator, 14, which is preprogrammed with appropriate control instructions and is controlled by controller, 20, similarly to the fashion in which controller, 12 is controlled by controller, 20.)

Digital recorder, 16, is a memory storage element of standard design that receives information from buffer/comparator, 14, and records said information in a predetermined fashion. In a predetermined fashion,

recorder, 16, can determine how full it is and transmit this information to controller, 20. Recorder, 16, may inform controller, 20, automatically when it reaches a certain level of fullness.

Signal processor, 26, has a controller device which includes programmable RAM controller, 20; ROM, 21, that may contain unique digital code information capable of identifying signal processor, 26, and the subscriber station of said processor, 26, uniquely; an automatic dialing device 24; and a telephone unit, 22. A particular portion of ROM, 21, is erasable programmable ROM (hereinafter, "EPROM") or other forms of programmable nonvolatile memory. Under control particular preprogrammed instructions at that portion of ROM, 21, that is not erasable, signal processor, 26, has capacity to erase and reprogram said EPROM in a fashion that is described more fully below. Controller, 20, has capacity for controlling the operation of all elements of the signal processor and can receive operating information from said elements. Controller, 20, has capacity to turn off any element or elements of controlled subscriber station apparatus, in whole or in part, and erase any or all parts of erasable memory of said controlled apparatus.

As an apparatus in the unified system of programming communication of the present invention, a signal processor can monitor any combination of inputs and transmission frequencies, and the signal processor of FIG. 2 is but one embodiment of a signal processor. Other embodiments can receive and monitor available programming in transmission frequencies other than radio and television frequencies through the addition of one or more other signal decoders such as that of FIG. 2C described below. Embodiments can receive one or more fixed frequencies continuously at one or more decoders that monitor for available programming. For certain applications, one particular embodiment (hereinafter, "signal processor alternative #1") can be configured to receive only other inputs at buffer/comparator, 8, in which case said embodiment has no oscillator, 6; switch, 1; mixers, 2 and 3; or decoders, 30 or 40. For other particular applications, another particular embodiment (hereinafter, "signal processor alternative #2") can be configured to receive only inputs at buffer/comparator, 14, in which case said embodiment has only buffer/comparator, 14; recorder, 16; clock, 18; and the control device apparatus associated with controller, 20. Other signal processor embodiments will become apparent in this full specification. Which ~~sources. It follows standard password protection techniques well known in the art.~~

~~Operation of Signal Processor Apparatus~~

~~The simplest forms~~particular embodiment of signal processor is preferred at any given subscriber station depends on the particular communications requirements of said station.

Signal Decoders

Signal decoder apparatus ~~are each of the five~~such as decoder, 203, in FIG. 1 and decoders, 30 and 40, in FIG. 2 are basic in the unified system of this invention.

FIG. 2A shows a TV signal decoder that detects signal information embedded in an inputted television frequency, renders said information into digital signals that subscriber station apparatus can process,

identifies the particular apparatus to which said signals are addressed, and outputs said signals to said apparatus. Decoder, 203, in FIG. 1 is one such TV signal decoder; decoder, 30, in FIG. 2 is another.

In FIG. 2A, a selected frequency is inputted at a fixed frequency to said decoder at filter, 31, which defines the particular channel of interest to be analyzed. The television channel signal then passes to a standard amplitude demodulator, 32, which uses standard demodulator techniques, well known in the art, to define the television base band signal. This base band signal is then transferred through separate paths to three separate detector devices. The apparatus of these separate paths are designed to act on the particular frequency ranges in which embedded signal information may be found. The first path, designated A, detects signal information embedded in the video information portion of said television channel signal. Path A inputs to a standard line receiver, 33, well known in the art. Said line receiver, 33, receives the information of one or more of the lines normally used to define a television picture. It receives the information only of that portion or portions of the overall video transmission and passes said information to a digital detector, 34, which acts to detect the digital signal information embedded in said information, using standard detection techniques well known in the art, and inputs detected signal information to controller, 39, which is considered in greater detail below. The second path, designated B, detects signal information embedded in the audio information portion of said television channel signal. Path B inputs to a standard audio demodulator, 35, which uses demodulator techniques, well known in the art, to define the television audio transmission and transfers said audio information to high pass filter, 36. Said filter, 36, defines and transfers to digital detector, 37, the portion of said audio information that is of interest. The digital detector, 37, detects signal information embedded in said audio information and inputs detected signal information to controller, 39. The third path, designated C, inputs the separately defined transmission to a digital detector, 38, which detects signal information embedded in any other information portion of said television channel signal and inputs detected signal information to controller, 39. Line receiver, 33; high pass filter, 36; detectors, 34, 37, and 38; and controller, 39, all operate under control of controller, 39, and in preprogrammed fashions that may be changed by controller, 39.

FIG. 2B shows a radio signal decoder that detects and processes signal information embedded in an inputted radio frequency. Decoder, 40, in FIG. 2 is one such radio signal decoder. A selected frequency of interest is inputted at a fixed frequency to standard radio receiver circuitry, 41, which receives the radio information of said frequency using standard radio receiver techniques, well known in the art, and transfers said radio information to radio decoder, 42. Radio decoder, 42, decoders the signal information embedded in said radio information and transfers said decoded information to a standard digital detector, 43. Said detector, 43, detects the binary signal information in said decoded information and inputs said signal information to controller, 44, discussed more fully below. Circuitry, 41; decoder, 42; and detector, 43, all operate under control of controller, 44, and in predetermined fashions that may be changed by controller, 44.

FIG. 2C shows a signal decoder that detects and processes signal information embedded in a frequency other than a television or radio

frequency. A selected other frequency (such as a microwave frequency) is inputted to appropriate other receiver circuitry, 45, well known in the art. Said receiver circuitry, 45, receives the information of said frequency using standard receiver techniques, well known in the art, and transfers said information to an appropriate digital detector, 46. Said detector, 46, detects the binary signal information in said information and inputs said signal information to controller, 47, considered more fully below. Circuitry, 45, and detector, 46, operate under control of controller, 47, and in predetermined fashions that may be changed by controller, 47.

Each decoder is controlled by a controller, 39, 44, or 47, that has buffer, microprocessor, ROM, and RAM capacities. Said buffer capacity of controller, 39, 44, or 47, includes capacity for receiving, organizing, and storing simultaneous inputs from multiple sources while inputting information, received and stored earlier, to said microprocessor capacity of controller, 39, 44, or 47. Said microprocessor capacity of controller, 39, 44, or 47, is of a conventional type, well known in the art, and is specifically designed to have particular register memories, discussed more fully below, including register capacity for detecting particular end of file signals in inputted information. The ROM capacity of controller, 39, 44, or 47, contains microprocessor control instructions of a type well known in the art and includes EPROM capacity. Said ROM and/or said EPROM may also contain one or more digital codes capable of identifying its controller, 39, 44, or 47, uniquely and/or identifying particular subscriber station functions of said controller, 39, 44, or 47. The RAM capacity of controller, 39, 44, or 47, constitutes workspace that the microprocessor of said controller, 39, 44, or 47, can use for intermediate stages of information processing and may also contain microprocessor control instructions. Capacity exists at said controller, 39, 44, or 47, for erasing said EPROM, and said RAM and said EPROM are reprogrammable.

Controller, 39, 44, or 47, is preprogrammed to receive units of signal information, to assemble said units into signal words that subscriber station apparatus can receive and process, and to transfer said words to said apparatus. In each decoder, the controller, 39, 44, or 47, receives detected digital information from the relevant detector or detectors, 34, 37, 38, 43, and 46. Upon receiving any given instance of signal information, controller, 39, 44, or 47, is preprogrammed to process said information automatically. Controller, 39, is preprogrammed to discard received duplicate, incomplete, or irrelevant information; to correct errors in retained received information by means of forward error correction techniques well known in the art; to convert, as may be required, the corrected information, by means of input protocol techniques well known in the art, into digital information that subscriber station apparatus can receive and process; to modify selectively particular corrected and converted information in a predetermined fashion or fashions; to identify in a predetermined fashion or fashions subscriber station apparatus to which said signal information should be transferred; and to transfer said signals to said apparatus. Said controller, 39, 44, or 47, has one or more output ports for communicating signal information to said apparatus.

Controller, 39, 44, or 47, has capacity for identifying more than one apparatus to which any given signal should be transferred and for transferring said signal to all said apparatus. It has capacity for

recording particular signal information in particular register memory and for transferring a given signal to one apparatus, modifying it and transferring it to a second apparatus, and modifying it again and transferring it to a third apparatus.

~~paths~~As described above, said controller, 39, 44, or 47, controls particular apparatus of its signal decoder and has means for communicating control information to said apparatus. Said controller, 39, 44, or 47, also has means for communicating control information with a controller, 20, of a signal processor, 26. (Said communicating means is shown clearly in FIG. 2D which is discussed below.) Via said communicating means and under control of instructions and signals discussed more fully below, said controller, 20, has capacity to cause information at said EPROM to be erased and to reprogram said microprocessor control instructions at said RAM and said EPROM.

The Signal Processor System

Signal processing apparatus and methods involve an extended subscriber station system focused on the signal processor. Said system includes external signal decoders.

FIG. 2D shows one embodiment of a signal processing system. Said system contains signal processor, 26, and external decoders, 27, 28, and 29. Each said external decoder may be a TV signal decoder (FIG. 2A) or a radio signal decoder (FIG. 2B) or an other signal decoder (FIG. 2C) depending on the nature of the selected frequency inputted. As FIG. 2D shows, each decoder, 27, 28, and 29, receives one selected frequency and has capacity for transferring detected, corrected, converted, and possibly modified signals to signal processor, 26, at buffer/comparator, 8, and also to other station apparatus. Each decoder, 27, 28, and 29, also has capacity for transferring detected, corrected, converted, and possibly modified monitor information to signal processor, 26, at buffer/comparator, 14. As FIG. 2D shows, controller, 20, has capacity to control all decoder apparatus, 27, 28, 29, 30, and 40. Controller, 20, has capacity to preprogram (or reprogram) all said decoder apparatus, 27, 28, 29, 30, and 40, and thereby controls the fashions of detecting, correcting, converting, modifying, identifying, transferring, and other functioning of said decoders.

Not every installed decoder in said signal processor system requires all the apparatus and system capacity of FIGS. 2A, 2B, and 2C. ~~Each path, by itself, is capable~~For example, ~~of identifying signals in the portions of programing transmissions that each receives. A digital signal is embedded by conventional generating and encoding means and transmitted in a television, radio or other transmission. Each path is capable of receiving a transmission or a portion of a transmission and detecting digital signals in that portion and transmitting said signals to in-line equipment for further processing. Each of the paths described in FIGS. 2A, 2B, and 2C can identify and process only signals embedded in the particular transmission channel inputted to said paths.~~

~~The signal processor apparatus described in FIG. 1 can identify such signals in multiple and variable locations in multiple and variable modes, channels, and transmissions. Such signals may be transmitted over and over continuously in such transmissions or they may be transmitted~~

~~over and over only for predetermined time intervals. The controller, 20, is programed to sequence the local oscillator, 6, to select each desired frequency for a specific time interval in accordance with a predetermined pattern. This pattern may be selected in accordance with standard broadcast and cablecast practices known to exist on that transmission line or frequency. The local oscillator, being thus sequenced, will allow each signal decoder, 30 and 40, to receive a particular frequency at a particular time interval. This will define the timing of the composite outputs of the digital detectors, 34, 37, and 38 in FIG. 2A, and 43 in FIG. 2B. The same controller will control buffer/comparator, 8, to discard received duplicate and partial signals, to mark signals with correct channel identifiers, to transfer signals to decrypter, 10, and processor or monitor, 12, as required, and to perform such other functions as buffer/comparator, 8, performs. The controller, 20, instructs decrypter, 10, what to decrypt and in what fashion. It instructs processor or monitor, 12, how to identify what signals to pass externally and where to pass them and what signals to transfer to buffer/comparator, 14. The controller, 20, instructs buffer/comparator, 14, what signals to discard and how to mark signals and assemble signal strings. The controller activates digital recorder, 16, thus defining the location in memory of each of the signals and signal strings. The controller, 20, also controls the automatic telephone dialing device, 24, which can automatically output the digital information on the digital recorder, 12, to a remote site through a telephone connection, 22. The controller, 20, can also set the proper time into clock, 18, should this step be necessary. The controller, 20, operates in a predetermined fashion that can be altered by external means communicating by means of the telephone connection, 22.~~

~~Method of Use at an Intermediate Transmission Point~~

~~The signal processing apparatus outlined in FIGS. 1, 2A, 2B, and 2C, and their variants as appropriate, can be used to automate the operations of an intermediate transmission point whether it be a broadcast station transmitting only a single channel of programing or a cable system cablecasting many channels. They can be used in a facility transmitting television programing, radio programing, and making other electronic transmissions.~~

~~FIGS. 3A, 3B and 3C illustrates one instance of such use. FIGS. 3A, 3B and 3C illustrate the use of Signal Processing Apparatus and Methods at a cable television system "head end" transmission facility that cablecasts several channels of television programing. The means for and method of transmission of programing described here is well known in the art. The facility receives programing from many sources. Transmissions may be received from satellites by satellite antenna, 50, low noise amplifiers, 51 and 52, and TV receivers, 53, 54, 55, and 56. Microwave transmissions can be received by microwave antenna, 57, and television video and audio receivers, 58 and 59. Conventional TV broadcast transmissions can be received by antenna, 60, and TV demodulator, 61. Other electronic programing input means, 62, can receive programing transmissions. All of these received transmissions feed into the facility by hard-wire and connect, by means of conventional switches (here matrix switch, 75), to one or more video recorder/players, 76 and 78, and/or to equipment that outputs them over various channels to the cable system's field distribution system, 93, which equipment includes here cable channel modulators, 83, 87, and 91, and channel combining and multiplexing system, 92. Programing can also be manually delivered to the facility on~~

~~prerecorded video tapes and videodiscs. When played on video recorder and players, 76 and 78, or other similar equipment well known in the art, such prerecorded programing can be transmitted to the field.~~

~~In the present art, the identification of incoming programing, however received; the operation of video player and recorder equipment, 76 and 78; and the maintenance of records of programing transmissions are all largely manual operations.~~

~~FIGS. 3A, 3B and 3C show the introduction of signal processing apparatus and methods to automate these and other operations.~~

~~Incoming programing transmissions are received at the relevant receiver points, antennas, 50, 57, and 60, and other means, 62. They are fed along the conventional paths described above. At distribution amplifiers, 63 through 70, each incoming feed is split into two paths. One is the conventional path whereby programing has flowed and continues to flow to recording devices, 76 and 78, and/or to flow to field distribution system, 93. The other path flows from each distribution amplifier, 63 through 70, individually to signal processor, 71. Signal processor, 71, has means, described above, to identify and separate the instruction and information signals from their associated programing and pass them, along with information identifying the channel source of each signal, externally to code reader, 72. Signal processor, 71, also has means to record said signals and transfer them to external communications network, 97. It also has means to record and transfer simultaneously.~~

~~Code reader, 72, passes the received signals, with channel identifiers, to cable program controller and computer, 73.~~

~~Cable program controller and computer, 73, is the central automatic control unit for the transmission facility.~~

~~The controller/computer, 73, has means for receiving input information from local input, 74, and from remote sources via telephone or other data transfer network, 98. Such input information might include the cable television system's complete programing schedule, with each discrete unit of programing identified with a unique program code (which in the case of advertising might be a purchase order number). Such input information might also indicate when and where the cable head end facility should expect to receive the programing. Such input information might also indicate when and on which channel or channels the head end facility should transmit each program unit to cable field distribution system, 93.~~

~~By means of the signals, with channel indicators, received from code reader, 72, controller/computer, 73, can determine what specific programing and programing unit has been received by each receiver, 53 through 62, and is passing in line on each individual wire to matrix switch, 75.~~

~~By comparing identification signals on the incoming programing with the programing schedule received earlier from local input, 74, and/or from a remote site via network, 98, controller/computer, 73, can determine when and on what channel or channels the head end facility should transmit the programing.~~

~~Controller/computer, 73, has means for communicating control information~~

~~with matrix switch, 75, and video recorder/players, 76 and 78. If incoming programing is meant for immediate transmission, controller/computer, 73, instructs matrix switch, 75, to configure its switches so as to transfer incoming programing to the proper output channel. For example, if controller/computer, 73, determines that programing incoming via receiver, 53, should be transmitted immediately to the field distribution system, 93, via cable channel modulator, 87, controller/computer, 73, instructs matrix switch, 75, to configure its switches so as to transfer programing transmissions inputted from TV receiver, 53, to the output that leads to modulator, 87. Similarly, if controller/computer, 73, determines that incoming programing should be recorded for delayed transmission, controller/computer, 73, selects a video recorder/player, 76 or 78, in a predetermined fashion, to record the incoming programing, instructs matrix switch, 75, to transfer the programing to the designated recorder/player, 76 or 78, and instructs the recorder/player, 76 or 78, to turn on and record the programing.~~

~~Recorder/players, 76 and 78, can communicate programing with each other through matrix switch, 75. If controller/computer, 73, determines at any time that it is necessary to reorganize the order in which programing units are stored on either recorder/player or on both, controller/computer, 73, can use techniques for reorganizing files stored on multidisk units, which techniques are well known to computer operators, and order the execution of such techniques by passing appropriate instructions to of matrix switch, 75, and recorder/ players, 76 and 78. Were this head end facility equiped with automatic operating equipment well known in television studios, controller/computer, 73, could pass appropriate operating instructions to such equipment.~~

~~Controller/computer, 73, monitors the operation of the head end facility by means of TV signal decoders, 77, 79, 80, 84, and 88, each of which are shown in detail in FIG. 2A. Controller/computer, 73, has means to communicate control information with each decoder, 77, 79, 80, 84, and 88, to tell each how to operate and how and where to look for signals and to communicate other information. (This particular embodiment could be expanded to include a decrypter, such as decrypter 10 in FIG. 1, in signals-only line between each decoder, 77, 79, 80, 84, and 88, and controller/computer, 73.) Decoders, 80, 84, and 88, inform controller/computer, 73, what programing is passing on each cable channel and what signals the programing contains. Decoders, 77 and 79, inform controller/computer, 73, what specific programing is loaded on recorder/players, 76 and 78 respectively, and what signals it contains. (Among other signals, a program unit could contain signals that would inform controller/computer, 73, of the distance to the beginning and end of the program unit which signals would facilitate operation of recorder/players such as 76 and 78.)~~

~~The cable head end facility also contains signal strippers, 81, 85, and 89, of which models exist well known in the art, that controller/computer, 73, can instruct to remove signals from programing as required, and signal generators, 82, 86, and 90, also well known in the art, that controller/computer, 73, can instruct to add signals to programing as required. At each point, 81, 85, and 89, there may be single or multiple strippers. At each point, 82, 86, and 90, there may be single or multiple generators.~~

~~Beyond channel combining system and multiplexer, 92, amplifier, 94,~~

~~transmits programing to signal processor, 71, and signal processor, 96, which permits both apparatus to monitor and record all the programing transmitted by the cable television system head end facility to field distribution system, 93. Such records can provide automatically for each channel the information that the Federal Communications Commission requires broadcast station operators to maintain as station logs. Signal processors, 71 and 96, can transmit such records of programing to remote sites via telephone or other data transfer networks, 97 and 99 respectively.~~

~~This particular embodiment describes a transmission facility transmitting only television programing. The facility could also process and transmit radio programing and other electronic data according to the methods described here by adding radio decoder paths and other signal decoder paths, as shown in FIGS. 2B and 2C respectively, to signal processors, 71 and 96, and decoders, 77, 79, 80, 84, and 88. Likewise, these methods are also applicable in a facility that transmits only a single channel of radio or television programing.~~
~~Methods for Governing the Reception of Programing~~

~~FIGS. 4A through 4E illustrate methods for governing the reception of programing and the use of signal processor apparatus in these methods. All of these methods involve the use of one or more devices, of which various models exist well known in the art, for the decryption of programing transmissions and/or one or more other means for interrupting programing transmissions, also well known in the art, which may be as simple as a switch and which may have means to interrupt programing by generating noise which noise may be an overlay of another audio and/or video transmission.~~

~~FIG. 4A shows a signal processor, 100, and a programing decrypter and/or interrupt means, 101, each of which receives the same transmission of programing. The devices, 100 and 101, may receive one channel of programing or multiple channels. The signals that enable the decrypter/interrupter, 101, to decrypt and/or transfer programing uninterrupted may be embedded in the programing or may be elsewhere. Signal processor, 100, identifies, evaluates, possibly decrypts, and passes a signal or signals to decrypter/interrupter, 101, either at the time of receipt of such programing or at a delayed time or a combination. The signal or signals instruct decrypter/interrupter, 101, to decrypt the transmission or not to decrypt the transmission or to interrupt the transmission or not to interrupt the transmission. The signal or signals may also inform decrypter/interrupter, 101, how to decrypt or interrupt the programing if decrypter/interrupter, 101, is capable of multiple means. The signal or signals may transmit a code or codes necessary for the decryption of the transmission.~~

~~FIG. 4A also shows local input, 102, with means for generating and transmitting signals to signal processor, 100. Local input, 102, is intended to permit a person at a local receiving site that is prevented, by any means, from receiving programing to instruct signal processor, 100, that the site wants to be enabled to receive the programing. Local input, 102, may also serve other purposes. Local input, 102, may convey a continuous signal or an occassional signal or a one-time-only signal. It may be activated by one or more switches or buttons or combinations. It may be a computer acting in a predetermined fashion. The signal may be input to signal processor, 100, as described in FIG. 1, at~~

~~buffer/comparator, 8, or signal processor or monitor, 12, or buffer/comparator, 14.~~

~~In the preferred embodiment, local input, 102, inputs a one-time signal to signal processor, 100, at buffer/comparator, 8, and transmits information in a digital code signal which information is input to local input, 102, in an alphanumeric form manually by means of buttons.~~

~~FIGS. 4B and 4C illustrate various alternative ways that signals may be input to the signal processor, 100, 103, or 106 as applicable. The fundamental point is that signals may be received in a manner that requires decryption and/or transmission by a decryptor/interruptor, 104, before they reach the signal processor, as with signal processor 103 in FIG. 4B, or they may not, as with signal processor 100 in FIG. 4A, or some combination, as with signal processor 106 in FIG. 4C.~~

~~However, FIGS. 4A, 4B, and 4C do not fully illustrate this point because these figures do not reveal that the question of the need for decryption prior to reaching the signal processor depends, among other things, on where the signal or signals are placed in the incoming transmission. A decrypter does not necessarily decrypt the entire transmission. Encrypted transmissions may be only partially encrypted. For example, only the video portion of the transmission may be encrypted. The audio portion may remain unencrypted. In such a circumstance, a connection such as that shown in FIG. 4B could pass unencrypted signals to signal processor 103, while passing a transmission unsuitable for satisfactory viewing, if the signals were placed in the audio portion of the overall transmission.~~

~~FIG. 4C illustrates a configuration that permits a method that provides a signal or signals to signal processor, 106, prior to decryption which signal or signals enables decryptor/interruptor, 107, to decrypt and/or pass programing transmissions it receives then signal processor, 106, searches in a predetermined fashion for a second signal or set of signals in the decrypted output of decryptor/interruptor, 107. If this second signal or set of signals fails to appear in the form or forms and place or places and time or times that signal processor, 106, expects, signal processor, 106, can respond in a predetermined fashion and generate and record in digital recorder, 16 (referring to FIG. 1), information that reports this fact in a predetermined fashion and/or transfer this information immediately to a remote site by telephone means and/or generate and transmit to decryptor/interruptor, 107, instructions that disable decryptor/interruptor, 107.~~

~~FIG. 4D shows that a multi-stage decryption/interruption process may be used in which transmissions must be processed by one or more additional decryptor/interruptors, 111, that follow decryptor/interruptor, 110.~~

~~FIG. 4E illustrates that the signal processor, 112, can monitor multiple channels and pass instructions to multiple decryptor/interruptors, each of which processes fewer channels than the multiple channels processed by signal processor, 112. FIG. 4E illustrates how signals transmitted on one channel can govern the decryption and/or transfer of another channel. Signal processor, 112, receives, evaluates, and processes a multiple channel transmission from cable transmission facility, 113. Cable converter box, 114, of which many types are now available, with means for informing signal processor, 112, which channel of programing it is transferring, receives the same multi-channel transmission and transfers~~

~~one channel to decryptor/interruptor, 115. The signal or signals necessary for the decryption of the channel that box, 114, passes to decryptor/interruptor, 115, in this case, is not located in the channel transmission. They may be preprogramed into the signal processor (for example, in programable randon access memory controller, 20, in FIG. 1) or they may be transmitted in a channel other than the channel being transferred from box, 114. If signal processor, 112, has been preprogramed with the signal or signals or if it has been informed of the predetermined fashion for identifying and processing the the needed signal or signals in the incoming transmission from facility, 113, for example, where to look for the signals and when and how, signal processor, 112, can transfer the signal to decryptor/interruptor, 115. The tuner, 119, informs signal processor, 112, what channel box, 114, is switched to whenever box, 114, is switched or turned on. Signal processor, 112, receives this information probably at buffer/comparator, 8 (referring to FIG. 1), which signal processor, 112, processes the signal from tuner, 119, in a predetermined fashion that causes the signal or signals that relate to the necessary proper operation of decryptor/interruptor, 115. If signal processor, 112, can identify, processes, and transfer the needed signal or signals, decryptor/interruptor, 115, can decrypt and/or transfer the incoming transmission from box, 114, satisfactorily. If signal processor, 112, cannot transfer the needed signal or signals, decryptor/interruptor, 115, cannot decrypt and/or transfer the programing transmission satisfactorily.~~

~~FIG. 4E also illustrates how it may be necessary to decrypt a programing transmission on one channel in order to identify and process correctly the programing transmitted on another. In FIG. 4E, the signal or signals needed to operate decryptor/interruptor, 115, correctly may be on a separate channel of programing that is, itself, encrypted in transmission. Signal processor, 112, can transfer the correct signal or signals only if cable converter box, 117, is tuned to the proper channel and decryptor/interruptor, 118, can transfer a correctly decrypted transmission to signal processor, 112, for processing.~~

~~In any of the cases illustrated in FIGS. 4A through 4E, signal processors, 100, 103, 106, 109, and 112, could also operate in a predetermined fashion and telephone a remote site to get an additional signal or signals necessary for the proper decryption and/or transfer of incoming programing transmissions.~~

~~Methods for Monitoring Reception and Operation~~

~~FIG. 5 illustrates methods for monitoring reception and operation which methods can be used to gather statistics on programing usage and associated uses of other data transmissions and equipment. Such statistics are necessary, for example, in the development of television program ratings.~~

~~FIG. 5 shows two conventional TV sets, 132 and 144, a conventional video cassette recorder, 135, a conventional videodisc player, 137, a conventional radio, 141, a conventional microcomputer, 142, a conventional data printer, 146, and a television set, 148, that is capable of displaying two different television programing transmissions at once. This is only a representative group of equipment. Many other types of television and radio players and recorders could be included in FIG. 5.~~

~~Except for the videodisc player which neither records nor displays programing or other data, each unit has an appropriate associated signal decoder. Each decoder is likely to be located physically inside its associated player/recorder unit. Each is located at a point in the associated unit's circuitry where it receives every embedded signal on the programing channel or data channel to which the unit is tuned for which signal the decoder is programed in a predetermined fashion to search.~~

~~If a unit like the microcomputer can receive transmissions from more than one source or of more than one kind--television, radio, or other--it will have sufficient apparatus to monitor every channel and kind of transmission it can receive.~~

~~The signals for which the decoders are monitoring are likely to be unique digital codes that may identify each programing or data unit received and the source of each. They may identify networks, broadcast stations, channels on cable systems, and possibly times of transmission. They may convey unique identifier codes for each program or commercial. In the case of data transmitted to the microcomputer, they may be unique codes that identify the source and suppliers of the data. In the case of data received at the printer, they may identify publications, articles, publishers, distributors, advertisements, etc. The decoders, 131, 136, 138, 143, 145, 147, 149, and 150, may search for many types of codes, and the types described here provide only examples.~~

~~In FIG. 5, each decoder receives every relevant signal received by its associated player or recorder unit. For example, TV set, 131, may receive programing from many sources including cable converter box, 133, video cassette recorder, 135, and videodisc player, 137. In every programing unit played on TV set, 132, TV decoder, 131, receives every signal for which it is instructed to search in a predetermined fashion and transfers the signals to signal processor, 130, which has means to identify the source decoder from which each signal that it receives comes. On all programing recorded by video cassette recorder, 135, decoder, 136, receives every relevant signal and transfers such signals to signal processor 130. Radio signal decoder, 138, operates similarly for radio, 141. Other signal decoder, 143, for microcomputer 142. TV signal decoder, 145, for TV set, 144 (which may receive programing inputs and associated signals generated or transferred by microcomputer, 142). Other signal decoder, 147, for printer 146. And TV signal decoders, 150 and 149, for each channel of programing received and displayed by multi-picture TV set, 148.~~

~~One particular advantage of these methods for monitoring programing is that, by locating the identifier signals in the audio and/or video and/or other parts of the programing that are conventionally recorded by, for example, conventional video cassette recorders, these methods provide techniques for gathering statistics on what is recorded on video cassette recorders and on how people replay such recordings. For example, a person might instruct video cassette recorder, 135, automatically to record the NBC Network Nightly News as broadcast over station WNBC in New York City. Recorder, 135, might receive the programing over Manhattan Cable TV channel 4 and record the programing from 7:00 PM to 7:30 PM on the evening of July 15, 1985. Each discrete bit of this information could be conveyed to recorder, 135, in a signal unit or units in the programing so~~

~~received and recorded. Decoder, 136, would identify these signals and transfer them to signal processor, 130. Subsequently, the person might play the recorded programing on TV set, 132, from 10:45 PM to 11:15 PM the same evening. This time, TV signal decoder, 131, identifies the embedded signals and transfers them to signal processor, 131. Prerecorded video cassettes and videodiscs could also contain unique embedded codes that would identify their usage (and could also transfer instructions to other external equipment).~~

~~Signal processor, 130, would probably receive these signals from decoders, 131, 136, 138, 143, 145, 147, 149, and 150) at its buffer/comparator unit, 14 (referring to FIG. 1), in a predetermined fashion that would permit signal processor, 130, to identify which decoder the individual signals come from and, in a predetermined fashion, create a signal string by appending digital information to the received signal which information might identify the individual decoder, 131, 136, 138, 143, 145, 147, 149, or 150 and the time of receipt at signal processor, 130. To minimize the use of data recorder, 16, buffer/comparator, 14, may evaluate signals in a predetermined fashion and discard some signals rather than passing them to the recorder, 16. It may compare each signal from a given source such as decoder, 131, with other signals received earlier from the same source. It may only count incoming duplicate signals or it may append a time code to the end of the basic signal string formed around the first received signal and alter this time designation each time a new duplicate signal is identified so that the time code identifies the time of receipt of the last duplicate signal. Whatever method is used, the buffer/comparator, 14, may discard all duplicate signals received. At a time when buffer/comparator, 14, determines in a predetermined fashion that it will receive no further duplicate signals, it transfers the full signal string to recorder, 16.~~

~~Signal divider, 139, illustrates another type of monitoring that signal processing apparatus and methods can facilitate. Signal divider, 139, monitors the use of signals rather than the use of programing. Every instruction or information signal transmitted from processor, 140, to microcomputer, 142, is also transmitted to signal processor, 130, to be handled, recorded, and transmitted to a remote site with all other monitor information. In a predetermined fashion, signal processor, 130, identifies and marks the source of signals as coming from a device, 139, monitoring signal usage rather than programing usage and viewership. In this fashion, besides facilitating data gathering on how programing is used, signal processing apparatus and methods also permit the evaluation of how equipment is used.~~

~~(For simplicity, FIG. 5 has focused only on methods whereby data is gathered from signal decoders remote from signal processor, 130. FIG. 5 has not included control information connections between signal processor, 130, and the remote decoders which would permit signal decoder, 130, to alter the methods of operation of said remote decoders. Such control information connections are included in signal processing apparatus and methods.)~~

~~Methods for Governing or Influencing the Operation of Equipment that is External to Conventional Television and Radio Sets by Passing Instruction and Information Signals that are Embedded in Television and Radio Programing Transmissions to Such External Equipment~~

~~Signal processor apparatus have the ability to identify instruction and~~

~~information signals in one or more inputted television and radio programing transmissions, identify and discriminate among one or more pieces of external equipment to which such signals are addressed, and transfer such signals to such equipment as directed. This permits many valuable techniques for facilitating the operation of such external equipment.~~

~~FIGS. 6A and 6B illustrate one possible configuration of equipment in a home or office or other television and/or radio receiving site. Consideration of FIGS. 6F and 6G is facilitated by consideration, first, of individual examples of the types of co-ordinated presentations that the signal apparatus and methods described here can permit.~~
~~Governing the Home or Office Environment~~

~~FIG. 6A illustrates a method for governing a home or office environment. One or more channels of television programing transmissions inputted to signal processor, 200, and cable converter box, 201, may contain signals intended for microcomputer, 205, which signals convey information on local weather conditions. Such signals might include current outside temperature and barametric readings. They might include forecast data. Signal processor, 200, is always operating and monitors all incoming channels. It can convey such signals to microcomputer, 205, whenever it receives them. TV signal decoder, 203, can also identify such signals but only in the one TV channel transferred by box, 201, to TV set, 202, and then only when TV set, 202, is on and operating. Decoder, 203, transfers all received signals to processor or monitor, 204, which identifies the signals as addressed to microcomputer, 205, and transfers them to microcomputer, 205. Microcomputer, 205, uses such received signals, in a predetermined fashion, to govern the operation of furnace, 206, air conditioning system, 207, and window opening and closing means, 208.~~
~~Co-ordinating a Stereo Simulcast~~

~~FIG. 6B illustrates a method for automatic co-ordination of a multimedia presentation in one place, in this case a stereo simulcast. A person decides to watch a program on television that is stereo simulcast on a local radio station, too. The person turns on television, 202, and tunes to the proper channel. TV signal decoder, 203, detects signals in the programing transmission on the channel which signals it transfers to monitor or processor, 204. Monitor or processor, 204, determines that certain signals are addressed to switch, 212, and transfers these signals to switch, 212. These signals instruct switch, 212, to turn power on to radio, 209, and its associated equipment, including a conventional digital tuner, 213. Monitor or processor, 204, also identifies signals addressed to tuner, 213, which it transfers accordingly. These signals instruct tuner, 213, to tune radio, 209, to the proper frequency for the simulcast. Automatically, by turning TV set, 202, to the channel with a stereo simulcast, the person has activated the stereo simulcast.~~

~~FIG. 6B also shows signal processor, 200, monitoring for a data gathering and ratings service. TV signal decoder, 203, and radio signal decoder, 211, also identify certain signals that monitors or processors, 204 and 210 respectively, determine to identify the programs, etc. on the channels to which TV set, 202, and radio, 209, are tuned, The processors, 204 and 210, transfer this information to signal processor, 200, for recording and subsequent transmission to a remote data collection site. Simultaneously, processor, 200, is also monitoring sequentially all other broadcast transmissions in the locality to gather further data on~~

~~programing availability to record and transmit to a remote site.~~
~~Receiving Selected Information and/or Programing~~

~~FIG. 6C illustrates methods for monitoring multiple programing channels and selecting programing and information in a predetermined fashion. In this example, microprocessor, 205, is programed to hold a portfolio of stocks and to receive news about these particular stocks and about the industries they are in. Several separate news services transmit news on different channels carried on the multi-channel cable transmission to converter boxes, 222 and 201, and to signal processor, 200. The news services preceed each news transmission with a unique signal that uniquely identifies the company or companies to which the news item refers and/or the industries. In a predetermined fashion, microcomputer, 205, instructs signal processor, 200, to hold examples of the sought for unique signals in its buffer/comparator, 8, and compare them with all incoming signals. Signal processor, 200, scans sequentially all channels. When it identifies a signal of interest, it relays that information and the channel identifier, in this illustration, to microcomputer, 205. In a predetermined fashion, either microcomputer, 205, or signal processor, 200, instructs tuner, 223, to set cable converter box, 222, to the proper channel, and microcomputer, 200, may record the information in memory or transfer it to printer, 221, for printing.~~

~~In the same fashion, microcomputer, 205, may also instruct signal processor, 200, to monitor single or multiple television channels and/or radio channels for programing of interest to play or record.~~

~~In another example, microcomputer, 205 may be preinformed that a certain television program, hypothetically "Wall Street Week," should be televised on TV set, 202, when it is cablecast. Microcomputer, 205, is preinformed of the time of cablecasting. When that time comes, microcomputer, 205, receives no program identification signals whatever from TV signal decoder, 203, which indicates that the set, 202, is not on. Microcomputer, 205, instructs signal processor, 200, to pass all program and channel identifiers on all programing being cablecast on the multi-channel system. Signal processor, 200, receives this instruction from microcomputer, 205, at its processor or monitor, 12, which reacts, in a predetermined fashion by passing also externally to microcomputer, 205, all signals that it passes to buffer/comparator, 14. Analyzing these identifier signals in a predetermined fashion, microcomputer, 205, determines that "Wall Street Week" is being televised on channel X. Then, in a predetermined fashion, microcomputer, 205, may instruct tuner, 214, to switch box, 201, to channel X and may instruct control system, 220, to turn video recorder, 217, on and record "Wall Street Week," and also microcomputer, 205, may instruct switch, 216, to turn TV set, 202, on and tuner, 215, to tune appropriately to "Wall Street Week."~~
~~Co-ordinating Multimedia Presentations in Time~~

~~FIG. 6C can also illustrate how programing delivered at different times to one place can be co-ordinated to give a multimedia presentation at one time in one place.~~

~~Each weekday, microcomputer, 205, receives, about 4:30 PM, by means of a digital information channel, all closing stock prices applicable that day. It may receive these directly or it may automatically query a data service for them in a predetermined fashion. It records those prices that relate to the stocks in its stored portfolio.~~

~~Microcomputer, 205, is preprogramed to respond in a predetermined fashion to instruction signals embedded in the "Wall Street Week" programing transmission. When the "Wall Street Week" transmission begins at 8:30 PM on a Friday evening, several instruction signals are identified by decoder, 203, and transferred to microcomputer, 205. These signals instruct microcomputer, 205, to generate several graphic video overlays, which microcomputer, 205, has the means to generate and transmit and TV set, 202, has the means to receive and display, and to transmit these overlays to TV set, 202, upon command. Subsequently in the program, the host says, "Here is what the Dow Jones Industrials did is the past week," and a studio generated graphic is pictured. The host then says, "Here is what the broader NASDAQ index did in the week past," and a studio generated graphic overlay is displayed on top of the first graphic. Then the host says, "And here is what your portfolio did." At this point, an instruction signal is generated in the television studio originating the programing and is transmitted in the programing transmission. This signal is identified by decoder, 203, and transferred via processor, 204, to microcomputer, 205. This signal instructs microcomputer, 205, to transmit the first overlay to TV set, 202, for as long as it receives the same instruction signal from processor, 204. The viewer then sees a microcomputer generated graphic of his own stocks' performance overlay the studio generated graphic. When the two studio generated graphics are no longer displayed, the studio stops sending the instruction signal, and the microcomputer, 205, ceases transmitting its own graphic to TV set, 202, and prepares to send the next locally generated graphic overlay upon instruction from the originating studio.~~

~~This is only one of many examples of the co-ordination at one time and in one place of programing and information material delivered at different times.~~

~~Co-ordinating Print and Video~~

~~FIG. 6D illustrates one method for co-ordinating the presentation of information through the use of print with video. FIG. 6D also illustrates possible uses of a decrypter and a local input.~~

~~Suppose a viewer watches a television program on cooking techniques that is received on TV set, 202, via box, 201. Julia Childs's "The French Chef" is one such program. Halfway through the program, the host says, "If you are interested in cooking what we are preparing here and want a printed copy of the recipe for a charge of only 10 cents, press 567 on your Widget Signal Generator and Local Input." The viewer then presses buttons 567 on local input, 225, which signal is conveyed to the buffer/comparator, 8 (referring to FIG. 1), of signal processor, 200, to hold and process further in a predetermined fashion. Five minutes later, a signal is identified in the incoming programing on TV set, 202, by decoder, 203, which is also transferred by processor, 204, to buffer/comparator, 8, of signal processor, 200. This signal instructs buffer/comparator, 8, that, if 567 has been received from signal generator, 225, signal processor, 200, should, in a predetermined fashion, instruct tuner, 223, to tune cable converter box, 222, to the appropriate channel to receive the recipe in encoded digital form and instruct control means, 226, to activate printer, 221. The signal transmission from processor, 204, also passes a signal word to signal processor, 200, which, in a predetermined fashion, signal processor, 200, decrypts and transfers to decrypter, 224, to serve as the code upon which~~

~~decrypter, 224, will decrypt the incoming encrypted recipe. Then, as part of the predetermined operation, signal processor, 200, conveys to its data recorder, 16, information that the 567 order was placed by the viewer and all necessary equipment was enabled. When the transmission of the recipe is received, box 222, transfers the transmission to decrypter, 224, for decryption and thence to printer, 221, for printing. Other signal decoder, 227, identifies a signal in the transmission received by printer, 221, which it passes via processor, 228, and buffer/comparator, 14, of signal processor, 200, to data recorder, 16. This signal indicates that the recipe, itself, has been received. Subsequently, when signal processor, 200, transfers the data in its data recorder, 16, via telephone to a remote site, that site can determine for billing purposes that the recipe was, first, ordered and, second, delivered.~~

~~(An alternate method for transmitting the recipe to printer, 221, would be for the recipe, itself, to be located in encoded digital form in the programing transmission received by TV set, 202. In this case, decoder, 203, would identify the signals conveying the recipe and transfer them via processor, 204, to signal processor, 200, which would decrypt them, itself, and transfer them, via means which in this case it would have, to printer, 221.)~~

~~Using Signaling and Decryption Techniques to Control Distribution of Copyrighted Materials~~

~~FIG. 6E illustrates a signaling and decryption technique which could serve to facilitate the electronic distribution of copyrighted materials such as books and movies by tending to discourage piracy and the unauthorized retransmission of copies, whether they be properly acquired or pirated.~~

~~FIG. 6E could be any home or commercial establishment but is described here as a book store. Using conventional laser videodisc equipment and techniques, well known in the art, a publisher has put his full line of books on laser discs in encrypted form and distributed one copy of each disc to each of his authorized book store retail outlets. He has also distributed to each a conventional computer floppy disk for use on conventional microcomputer, 205, that can operate conventional laser videodisc system, 232, in a predetermined fashion to locate and transmit individual titles in his line.~~

~~A customer comes into the book store and asks to buy a title, hypothetically, How to Grow Grass. The salesman asks the customer for suitable identification, types into microcomputer, 205, the customer's name and address and that he wishes to purchase How to Grow Grass. Microcomputer, 205, may check to determine that the customer has no record as a pirate then transfers his name and address to buffer/comparator, 8 (referring to FIG. 1), of signal processor, 200, and instructs laser videodisc system, 232, to transmit its encrypted copy of How to Grow Grass to printer or other means, 221, via decryptors, 224 and 231. Laser system, 232, transmits one copy of the encrypted title to decryptor, 224, and one to signal processor, 200, for processing and evaluation.~~

~~In the encrypted title, signal processor, 200, identifies one or more signal words. If signal processor, 200, has the customer's name and address and the bookstore is a retail outlet in good standing that has~~

~~received from a remote site program information on the predetermined fashions in affect, signal processor, 200, decrypts the signal word or words and transfers them to decryptor, 224, to serve as the code for the first stage of decryption.~~

~~Decryptor, 224, then decrypts a part of the encrypted transmission and passes the partly decrypted transmission to signal stripper, 229, and signal generator, 230. In the decrypted portion of the partially decrypted transmission, signal processor, 200, identifies a second signal word or set of words which it decrypts in a predetermined fashion and passes to decryptor, 231, to serve as the code basis for the second stage of decryption. Signal processor, 200, also may instruct signal stripper, 229, to remove this second signal word or words. Signal processor, 200, also passes the customer's name and address and its own unique apparatus identifier code from read only memory, 21, to signal generator, 230, which generates a signal embedding the customer's name and address and the retail outlet's identification in the programing in a suitable place or places in a suitable fashion. (Signal processor, 200, may also transmit the customer's name and address to printer or other means, 221, for actual printing of the customer's name and address in the text.) The transmission then passes through decryptor, 231, which completes the decryption process and passes the decrypted programing transmission to printer or other means, 221, and also to signal processor, 200. Signal processor 200, receives and analyzes the signal content of the programing output of decrypter, 231 to ensure that stripper, 229, and and generator, 230, have functioned properly. If they have not, signal processor, 200, shuts down the decryption of the title and prevents its delivery to the customer.~~

~~The General Case~~

~~It is obvious to one of ordinary skill in the art that the foregoing is presented by way of example only and that the invention is not to be unduly restricted thereby since modifications may be made in the structure of the various parts without functionally departing from the spirit of the invention. FIG. 6 should make this clear. The receiver site depicted in FIG. 6 has multiple means for receiving programing~~because a television base band signal is inputted to decoder, 203 of FIG. 1, said decoder does not require filter, 31, and demodulator, 32, of FIG. 2A. Likewise, because decoders, 30 and 40 of FIG. 2, transfer signals only to buffer/comparator, 8, said decoders do not require capacity to transfer signals to any other apparatus, and controllers, 39 and 44, of said decoders are preprogrammed only to identify whether or not any given signal should be transferred to buffer/comparator, 8. The precise apparatus and operating fashions of any given decoder is commensurate with the operating requirements of the installation and subscriber station of said decoder.

FIG. 2D shows decoders, 27, 28, and 29, communicating monitor information to buffer/comparator, 14, of signal processor, 26, by means of bus, 13. Said bus, 13, communicates information in a fashion well known in the art, and said decoders, 27, 28, and 29, gain access to the shared transmission facility of said bus, 13, using access methods, such as contention, that are well known in the art. Controllers, 12 and 20 of FIG. 2, 39 of FIG. 2A, 44 of FIG. 2B, and 47 of FIG. 2C, all have capacity to transfer signal information by bus means. Buffer/comparator, 8 and 14, and controller, 12, of FIG. 2 all have capacity to receive other input information from bus means. Furthermore, all apparatus of

FIG. 2 and of FIG. 2D can have capacity to communicate control information by one or more bus means.

Introduction to the Signals of the Integrated system

The signals of the present invention are the modalities whereby stations that originate programming transmissions control the handling, generating, and displaying of programming at subscriber stations.

(The term, "SPAM," is used, hereinafter, to refer to signal processing apparatus and methods of the present invention.)

SPAM signals control and coordinate a wide variety of subscriber stations. Said stations include so-called "local affiliate" broadcast stations that receive and retransmit single network transmissions; so-called "cable system headends" that receive and retransmit multiple network and local broadcast station transmissions; and so-called "media centers" in homes, offices, theaters, etc. where subscribers view programming. (Hereinafter, stations that originate broadcast transmissions are called "original transmission stations," stations that receive and retransmit broadcast transmissions are called "intermediate transmission stations", and stations where subscribers view programming are called "ultimate receiver stations.")

At said stations, SPAM signals address, control, and coordinate diverse apparatus, and the nature and extent of the apparatus installed at any given station can vary greatly. SPAM signals control not only various kinds of receivers and tuners; transmission switches and channel selectors; computers; printers and video and audio display apparatus; and video, audio, and digital communications transmission recorders but also signal processor system apparatus including decoders; decryptors; control signal switching apparatus; and the communications meters, called signal processors, of the present invention. Besides apparatus for communicating programming to viewers, SPAM signals also address and control subscriber station control apparatus such as, for example, furnace control units whose operations are automatic and are improved with improved information and subscriber station meter apparatus such as, for example, utilities meters that collect and transmit meter information to remote metering stations.

The information of SPAM signals includes data, computer program instructions, and commands. Data and program instructions are often recorded in computer memories at subscriber stations for deferred execution. Commands are generally for immediate execution and often execute computer programs or control steps in programs already in process. Often said data, programs, and commands control subscriber station apparatus that automatically handle, decrypt, transmit, and/or present program units of conventional television, radio, and other media.

In combined medium communications, SPAM signals also control subscriber station apparatus in the generating and combining of combined medium programming. At ultimate receiver stations, particular combined medium commands and computer programs cause computers to generate user specific programming and display said programming at television sets, speaker systems, printers, and other apparatus. (Hereinafter, instances of computer program information that cause ultimate receiver station apparatus to generate and display user specific information are called

"program instruction sets.") At intermediate transmission stations, other commands and computer programs cause computers to generate and transmit program instruction sets. (Hereinafter, instances of computer program information that cause intermediate transmission station apparatus to generate program instruction set information and/or command information are called "intermediate generation sets.")

In combined medium communications, particular SPAM commands control the execution of intermediate generation sets and program instruction sets and the transmission and display of information generated by said sets. Whether said commands control apparatus at intermediate transmission stations, ultimate receiver stations, or both, the function of said commands is to control and synchronize disparate apparatus efficiently in the display of combined medium programming at ultimate receiver stations. (Accordingly, all said commands are called "combining synch commands" in this specification.) Most often, combining synch commands synchronize steps of simultaneous generating of station specific information at pluralities of stations and/or steps of simultaneous combining at pluralities of stations (which steps of combining are, more specifically, steps of simultaneous transmitting at each station of said pluralities of separate information into combined transmissions), all of which steps are timed to control simultaneous display of user specific combined medium information at each station of pluralities of ultimate receiver stations.

The present invention provides a unified signal system for addressing, controlling, and coordinating all said stations and apparatus. One objective of said system is to control diverse apparatus in in the speediest and most efficient fashions. A second objective is to communicate control information in forms that have great flexibility as regards information content capacity. A third objective is to communicate information in compact forms, thereby maximizing the capacity of any given transmission means to communicate signal information.

Yet another objective is expandability. As the operating capacities of computer hardware have grown in recent decades, increasingly sophisticated software systems have been developed to operate computers. Often incompatibilities have existed between newly developed operating system software and older generations of computer hardware. It is the objective of the system of signal composition of the present invention to have capacity for expanding to accommodate newly developed subscriber station hardware while still serving older hardware generations. In practice this means that the unified system of signals does not consist, at any one time, of one fixed and immutable version of signal composition. Rather it is a family of compatible versions. At any given time, some versions communicate signal information to only the newest or most sophisticated subscriber station apparatus while at least one version communicates to all apparatus. Accordingly, this specification speaks of "simple preferred embodiments" and "the simplest preferred embodiment" rather than just one preferred embodiment. How the various versions and embodiments relate to and are compatible with one another is made clear below.

The Composition of Signal Information . . . Commands, Information Segments, and Padding Bits

SPAM signals contain binary information of the sort well know in the art including bit information required for error correction using forward

error correction techniques, well known in the art, in point to multi-point communications; request retransmission techniques, well known in the art, in point to point communications; and/or other error correction techniques, as appropriate.

FIG. 2E shows one example of the composition of signal information (excluding bit information required for error detection and correction). The information in FIG. 2E commences with a header which is particular binary information that synchronizes all subscriber station apparatus in the analysis of the information pattern that follows. Following said header are three segments: an execution segment, a meter-monitor segment, and an information segment. As FIG. 2E shows, the header and execution and meter-monitor segments constitute a command.

A command is an instance of signal information that is addressed to particular subscriber station apparatus and that causes said apparatus to perform a particular function or functions. A command is always constituted of at least a header and an execution segment. With respect to any given command, its execution segment contains information that specifies the apparatus that said command addresses and specifies a particular function or functions that said command causes said apparatus to perform. (Hereinafter, functions that execution segment information causes subscriber station apparatus to perform are called "controlled functions.")

Commands often contain meter-monitor segments. Said segments contain meter information and/or monitor information, and the information of said segments causes subscriber station signal processor systems to assemble, record, and transmit meter records to remote billing stations and monitor records to remote ratings stations in fashions that are described more fully below.

Particular commands (called, hereinafter, "specified condition commands") always contain meter-monitor segments. Said commands cause addressed apparatus to perform controlled functions only when specified conditions exist, and meter-monitor information of said commands specifies the conditions that must exist.

In simple preferred embodiments, at any given time the number of binary information bits in any given instance of header information is a particular constant number. In other words, every header contains the same number of bits. In the simplest preferred embodiment, said constant number is two, all headers consist of two bits binary information, and commands are identified by one of three binary headers:
10--a command with an execution segment alone;
00--a command with execution and meter-monitor segments; and
01--a command with execution and meter-monitor segments that is followed by an information segment.

Execution segment information includes the subscriber station apparatus that the command of said segment addresses and the controlled functions said apparatus is to perform. ("ITS" refers, hereinafter, to intermediate transmission station apparatus, and "URS" refers to ultimate receiver station apparatus.) Examples of addressed apparatus include:
ITS signal processors (in 71 in FIG. 6),
ITS controller/computers (73 in FIG. 6),
URS signal processors (200 in FIG. 7),

URS microcomputers (205 in FIG. 7),
URS printers (221 in FIG. 7), and
URS utilities meters (262 in FIG. 7).

Examples of controlled functions include:

Load and run the contents of the information segment.

Decrypt the execution segment using decryption key G.

Decrypt the execution and meter-monitor segments using decryption key J.

Commence the video overlay combining designated in the meter-monitor segment.

Modify the execution segment to instruct URS microcomputer, 205, to commence overlay designated in meter-monitor segment, record the contents of the execution and meter-monitor segments, and transfer command to URS microcomputer, 205.

Print the contents of the information segment.

Record the contents of the execution and meter-monitor segments; transfer them to URS decryptors, 224, and execute the preprogrammed instructions that cause URS decryptors, 224, to commence decrypting with said contents as decryption key; execute preprogrammed instructions that cause URS cable converter boxes, 222, to switch to cable channel Z; execute preprogrammed instructions that cause URS matrix switches, 258, to configure its switches to transfer the input from converter boxes, 222, to decryptors, 224, and the output from decryptors, 224, to microcomputers, 205; modify the execution segment to instruct URS microcomputers, 205, to commence loading and executing the information received from URS decryptors, 224 via URS switches, 258.

Commands can address many apparatus and execute many controlled functions. The apparatus and functions listed here are only examples. Other addressable apparatus and controlled functions will become apparent in this full specification.

Execution segment information operates by invoking preprogrammed operating instructions that exist at each subscriber station apparatus that is addressed. For example, a command to URS microcomputers, 205, to load and run the contents of the information segment following said command causes each URS microcomputer, 205, to commence processing particular instructions for loading and running that are preprogrammed at each URS microcomputer, 205.

For each appropriate addressed apparatus and controlled function combination a unique execution segment binary information value is assigned. Said command to URS microcomputers, 205, to load and run is, for example, one appropriate combination and is assigned one particular binary value that differs from all other execution segment information values. In the assignment process, no values are assigned to inappropriate combinations. For example, URS signal processors, 200, have no capacity to overlay, and no execution segment information value exists to cause URS signal processors, 200, to overlay.

For any given command, the execution segment information of said command invokes, at each relevant subscriber station apparatus, the preprogrammed operating instructions uniquely associated with its particular binary value in particular comparing and matching fashions that are described more fully below.

The determination of appropriate addressed apparatus and controlled function combinations takes into account the facts that different apparatus, at any given subscriber station, can be preprogrammed to

interpret any given instance of execution segment information differently and that subscriber station apparatus can be preprogrammed to automatically alter execution segment information. For example, if signal processors, 200, are preprogrammed to process commands received at controller, 12, differently from commands received at buffer/comparator, 8, the assignment system can reduce the number of required binary values. As a more specific example, buffer/comparator, 8, receives a hypothetical command with a particular execution segment (e.g., "101110") which means "URS signal processors, 200, decrypt the execution and meter-monitor segments using decryption key J." After being decrypted and transferred to controller, 12, the particular execution segment information that controller, 12, receives (e.g., "011011") means "URS microcomputers, 205, commence overlay designated in meter-monitor segment." The controlled functions that signal processor, 200, performs are the same as those listed above in the example that begins, "Modify the . . . ," and no separate binary value is necessary for invoking these controlled functions at URS microcomputers, 200.

The preferred embodiment includes one appropriate command (hereinafter called the "pseudo command") that is addressed to no apparatus and one command that is addressed to URS signal processors, 200, (hereinafter, the "meter command") but does not instruct said processors, 200, to perform any controlled function. These commands are always transmitted with meter-monitor segment data that receiver station apparatus automatically process and record. By transmitting pseudo command and meter command signals, transmission stations cause receiver station apparatus to record meter-monitor segment information without executing controlled functions. The pseudo command enables a so-called ratings service to use the same system for gathering ratings on conventional programming transmissions that it uses for combined media without causing combined media apparatus to execute controlled functions at inappropriate times (e.g., combine overlays onto displays of conventional television programming). The meter command causes apparatus such as controller, 12, of FIG. 2D to transmit meter information to buffer/comparator, 14, without performing any controlled function.

In the preferred embodiment, at any given time the number of binary information bits in any given instance of execution segment information is a particular constant number. In other words, every execution segment contains the same number of bits. Said constant number is the smallest number of bits capable of representing the binary value of the total number of appropriate addressed apparatus and controlled function combinations. And each appropriate combination is assigned a unique binary value within the range of binary numbers thus defined.

Meter-monitor segments contain meter information and/or monitor information. Examples of categories of such information include:

meter instructions that instruct subscriber station meter apparatus to record particular meter-monitor segment information and maintain meter records of said information;

origins of transmissions (e.g., network source stations, broadcast stations, cable head end stations);

dates and times;

unique identifier codes for each program unit (including commercials);

codes that identify uniquely each combining in a given combined medium program unit;

codes that identify the subject matter of a program unit;

unique codes for programming (other than programming identified by program unit codes) whose use obligates users to make payments (e.g., royalties and residuals); and

unique codes that identify the sources and suppliers of computer data. The categories listed here provide only examples. Other types of information can exist in meter information and/or in monitor information, as will become apparent in this full specification.

For each category of information, a series of binary bits (hereinafter, a "field" or "meter-monitor field") exists in the meter-monitor segment to contain the information. In any given category such as origins of transmissions, each distinct item such as each network source, broadcast, or cable head end station has a unique binary information code. In the preferred embodiment, the number of information bits in that category's meter-monitor field is the smallest number of bits capable of representing the binary value of the total number of distinct items. And the information code of each distinct item is within the range of binary numbers thus defined. In the preferred embodiment, date and time fields have sixteen bits.

Few commands require meter-monitor information of every information category. Often commands require no more than the identification codes of a specific combined medium program unit and of a specific combined medium combining within said program unit.

Because the amount of information in meter-monitor segments varies from command to command, in the preferred embodiment more than one format exists at any given time for meter-monitor segment information. For example, one meter-monitor segment may contain origin of transmission, transmission date and time, and program unit information. A second may contain program unit and combining identification information. The first is transmitted in a format of three specific fields. The second is transmitted in a different format. It is even possible for different formats to exist for the same meter-monitor field. For example, one instance of date and time information designates a particular day in a particular one hundred year period. Another designates a particular hour in a particular ninety day period.

Because the number of categories of meter-monitor information varies from one command to the next, the length of meter-monitor segments varies. Unlike execution segments which, at any given time, all contain the same number of information bits, the bit length of meter-monitor segments varies. One segment may contain five fields, totaling 275 bits in length. Another may contain two fields and 63 bits. A third may contain three fields and 63 bits. Bit length is not necessarily tied to the number of fields. And at any given time, a number of different meter-monitor segment bit length alternatives exists.

In the preferred embodiment, each instance of a meter-monitor segment includes a format field that contains information that specifies the particular format of the meter-monitor segment of said instance. Within said field is a particular group of binary information bits (hereinafter, the "length token") that identifies the number of bits in a meter-monitor segment of said format. Each alternate length token has a unique binary information code. The number of information bits in each instance of a length token is the smallest number of bits capable of representing the binary value of the total number of meter-monitor segment bit length

alternatives. And the unique code of each different alternative is within the range of binary numbers thus defined.

In the preferred embodiment, each distinct meter-monitor segment format (including each distinct field format) also has a unique binary information code. In cases where a given format is the only format that contains a given length token, the unique code of said token is sufficient to identify said format uniquely. For example, if a particular format is the only format that is 197 binary bits long, information that said format is 197 bits long is sufficient information to identify said format uniquely. But two or more formats that contain the same length token information require additional binary information to distinguish them uniquely Thus the number of information bits in any given instance of a format field is the total of the number of bits in the length token plus the smallest number of bits capable of representing the number of formats that share in common the one particular length token datum that occurs most frequently in different formats. And the format code of each distinct format is within the range of binary numbers thus defined except that only length token information exists in the bits of the length token.

FIG. 2F illustrates one instance of a meter-monitor segment (excluding bit information required for error detection and correction). FIG. 2F shows three fields totalling thirty sequential bits. The format field is transmitted first followed by two fields of nine and sixteen bits respectively, and the bits of the length token are the first bits of said format field. The SPAM system that uses said format field has capacity for no more than eight alternate meter-monitor segment lengths and thirty-two formats. A three bit length token can specify no more than eight length alternatives, and a five bit format field can specify no more than thirty-two. Said SPAM system has no fewer than five alternate lengths because four or fewer length alternatives would be represented in a length token of two or fewer bits. In said system, three or four formats share in common the particular length token that occurs most frequently in different formats. Two formats sharing the most commonly shared length token datum would be specified in one bit; five or more sharing said datum would be represented in three or more bits. Accordingly, the format field of FIG. 2F must represent at least eight alternate formats.

In the preferred embodiment, the bits of the length token are the first bits in each meter-monitor segment. In any given command containing meter-monitor information, said bits follow immediately after the last bit of the execution segment. The remaining bits of the format field are included in each meter-monitor segment in particular locations that lie within the format of the shortest meter-monitor segment (excluding bit information required for error detection and correction). Thus if the shortest meter-monitor segment (including the format field of said segment) is thirty two bits, the bits of the format field in every instance of a meter-monitor segment lie among the first thirty two bits of said segment.

Information segments follow commands and can be of any length. Program instruction sets, intermediate generation sets, other computer program information, and data (all of which are organized in a fashion or fashions well known in the art) are transmitted in information segments. An information segment can transmit any information that a processor can

process. It can transmit compiled machine language code or assembly language code or higher level language programs, all of which are well known in the art. Commands can execute such program information and cause compiling prior to execution.

A command with a "01" header is followed by an information segment. But a command with an "01" header is not the only instance of signal information that contains an information segment. In the simplest preferred embodiment, a fourth type of header is:

11--an additional information segment transmission following a "01" header command and one or more information segments which additional segment is addressed to the same apparatus and invokes the same controlled functions as said "01" command.

An instance of signal information with a "11" header contains no execution segment or meter-monitor segment information. Said instance is processed, in fashions described more fully below, by subscriber station apparatus that receive said instance as if said instance contained the execution segment information of the last "01" header command received at said apparatus prior to the receipt of said instance.

In determining the composition of signal information in the preferred embodiment, the present invention must take into account the fact that most computer systems communicate information in signal words that are of a constant binary length that exceeds one bit. At present, most computer information is communicated in so-called "bytes," each of which consists of eight digital bits. Failure to recognize this fact could result in incomplete signals and/or in erroneous processing in signal information. For example, FIG. 2G shows a command with a header, an execution segment, and a meter-monitor segment, each of which is of particular bit length. However, the command of FIG. 2G is only twenty-one bits long. As FIG. 2G shows, said command constitutes two bytes of eight bits each with five bits are left over. In a system that communicates information only in words that are multiples of eight, a signal whose information is represented in twenty-one information bits is incomplete. To constitute a complete communication, said signal must be transmitted in twenty-four bits. To the command of FIG. 2G, three bits must be added.

In the preferred embodiment, at the original transmission station of any given signal transmission, particular bits are added at the end of any command that is not already a multiple of the particular signal word bit length that applies in signal processor system communications at the subscriber stations to which said transmission is transmitted. (Hereinafter, said bits are called "padding bits.") Padding bits communicate no command information nor are padding bits part of any information segment. The sole purpose of padding bits is to render the information of any given SPAM command into a bit length that is, by itself, complete for signal processor system communication. Padding bits are added to command information prior to the transmission of said information at said station, and all subscriber station apparatus are preprogrammed to process padding bits. The particular number of padding bits that are added to any given command is the smallest number of bits required to render the bit length of said command into a multiple of said signal word bit length. FIG. 2H shows three padding bits added at the end of the twenty-one command information bits of the command of FIG. 2G. to render the information of said command into a form that can be communicated in three eight-bit bytes.

In the preferred embodiment, the information of each information segment is composed and transmitted in a bit length that is, itself, exactly a multiple of the particular signal word bit length that applies in computer communications at said subscriber stations. The information of each information segment commences at the first information bit location of the first signal word of said segment and ends at the last information bit location of the last signal word. Each information segments follow a command or "11" header. More precisely, the first signal word of each information segment is the first complete signal word that follows the last information bit of said command or "11" header or the last padding bit following said command or "11" header if one or more padding bits follow.

As one example, FIG. 2I shows the information of FIG. 2E organized in eight-bit bytes. While the information of the execution segment in FIG. 2I follows immediately after the header and the information of the meter-monitor segment follows immediately after the execution segment, the information of the information segment does not follow immediately after the meter-monitor segment. Rather three padding bits are inserted following the command information of FIG. 2I to complete the signal word in which the last bit of command information occurs, and the information of the information segment begins at the first bit of the first complete byte following said meter-monitor segment.

The method of the preferred embodiment for composing the information of SPAM signals has significant advantages.

In signal processing, speed of execution is often of critical importance, and the preferred embodiment has significant speed advantages. Most commands require the fastest possible processing. By minimizing the bit length of headers, execution segments, and meter-monitor segments, the preferred embodiment provides compact information and control messages that are transmitted, detected, and executed, in general, in the fastest possible fashion.

In signal processing, flexibility of message structure is also of critical importance. The single, unified system of the present invention must have capacity for communicating to many different apparatus messages that vary greatly in complexity, length, and priority for speed of processing. By providing first priority segment capacity--in the simplest preferred embodiment, execution segments--that is short, rigid in format, and can communicate information to many different addressed apparatus, the preferred embodiment provides capacity to communicate a select number of high priority control messages to many alternate apparatus in the fastest possible time. By providing intermediate priority segment capacity--in the simplest preferred embodiment, meter-monitor segments--that is flexible in length, format, and information content, the preferred embodiment provides more flexible capacity to communicate control messages of slightly lower priority. By providing lowest priority segment capacity--in the simplest preferred embodiment, information segments--that can contain any binary information and be any length, the preferred embodiment provides complete flexibility to communicate any message that can be represented in digital information to any apparatus at the lowest processing priority. By transmitting message components in their order of priority--in the simplest preferred embodiment, headers and execution segments then meter-monitor segments then information segments--the preferred embodiment enables priority message instructions

to affect subscriber station operations in the fastest possible fashion. By providing capacity for alternating the structure of individual messages--here alternate header capacity--so that individual control messages can be constituted only of the highest priority information or high and intermediate priority information or can be focused on the lowest priority, the preferred embodiment provides additional valuable flexibility.

Speed and flexibility are essential considerations not only in the composition of individual messages but also in the composition of message streams. In this regard, the use of "11" headers in the preferred embodiment brings valuable benefits.

Often in the course of a combined medium presentation, a series of control messages is transmitted each of which contains an information segment, addresses the same apparatus (for example, URS microcomputers, 205), and causes said apparatus to invoke the same controlled function or functions (for example, "load and run the contents of the information segment". Often, interspersed in said series, are other control messages that address said apparatus, contain no information segments, and cause said apparatus to invoke other controlled functions (for example, "commence the video overlay combining designated in the meter-monitor segment"). By including capacity whereby, without containing execution or meter-monitor information, a given message can cause information segment information to be processed at subscriber station apparatus just as preceding information segment information was processed, the present invention increases processing efficiency. Because no execution or meter-monitor segment is transmitted, more information segment information can be transmitted in a given period of time. Because no execution or meter-monitor segment is received and processed at subscriber stations, information segment information can be received and processed faster.

In signal processing, efficiency in the control of subscriber station apparatus is yet another factor of critical importance. By composing lowest priority segment information--in the simplest preferred embodiment, information of information segments--to commence at a bit location that subscriber station apparatus are preprogrammed to define as the first location of a signal word of the form that control said apparatus in processing and to continue to a bit location that is the last location of a signal word of said form, the present invention communicates said information to said apparatus in a form that can commence the control functions communicated in said information immediately. Were information segment information communicated in any form other than that of the preferred embodiment--more specifically, were said information to be in a length other than a whole number of signal words or to commence immediately after the command or header preceding said segment rather than at the first bit of a signal word--subscriber station apparatus would need to process said information into information of a form that could control said apparatus before the information of said segment could commence the particular control functions communicated in said information.

The Organization of Message Streams . . . Messages, Cadence Information, and End of File Signals

All of the information transmitted with a given header is called a

"message." Each header begins a message, and each message begins with a header. More specifically, a message consists of all the SPAM information, transmitted in a given transmission, from the first bit of one header to the last bit transmitted before the first bit of the next header.

A SPAM message is the modality whereby the original transmission station that originates said message controls specific addressed apparatus at subscriber stations. The information of any given SPAM transmission consists of a series or stream of sequentially transmitted SPAM messages.

Each instance of a header synchronizes all subscriber station apparatus in the analysis of the internal structure of the message that follows.

However, for the unified system of the present invention to work, subscriber station apparatus must have capacity for distinguishing more than the internal structure of individual messages. Said apparatus must also have capacity for processing streams of SPAM messages and distinguishing the individual messages in said streams from one another. More precisely, said apparatus must have capacity for processing streams of binary information that consist only of "0" and "1" bits and distinguishing which information, among said bits, is header information.

Cadence information which consists of headers, certain length tokens, and signals that are called "end of file signals" enables subscriber station apparatus to distinguish each instance of header information in any given message stream and, hence, to distinguish the individual messages of said stream. In the present invention, subscriber station apparatus are preprogrammed to process cadence information.

SPAM messages are composed of elements--headers, execution segments, meter-monitor segments, and information segments--whose bit lengths vary. SPAM apparatus determine the bit length of said elements in different fashions, and the particular fashion that applies to any given element relates to the priority of said element for subscriber station speed of processing. First priority segment information has the highest priority for speedy processing and is of fixed binary bit length. A SPAM header is one example of a first priority segment. An execution segment is another example. Intermediate priority segment information has lower priority, varies in bit length, but contains internal length information. A Meter-monitor segment is one example of an intermediate priority segment. Lowest priority segment information has the lowest priority, varies in length, and contains no internal information for determining segment length. Each information segment is an example of a lowest priority segment.

For a message that is constituted only of first priority segments, the information of the header is sufficient to distinguish not only the structure of the message but also the location of the next header. In the simplest preferred embodiment, a message with a "10" header is one example of a message constituted only of first priority segments. Commands with "10" headers consist of header information and execution segment information. At any given time, all instances of header information are of one constant length, and all instances of execution segment information are of a second constant length. Thus all "10" commands are, themselves, of a particular header+exec constant length, said header+exec constant being the sum of said one constant plus said

second constant. Because "10" messages have constant length and header information always occurs at a specific location in every instance of message information, by preprogramming subscriber station apparatus with information of said header+exec constant, the unified system of the present invention enables subscriber station apparatus to automatically identify the last command information bit of "10" messages. Said bit is always the bit that is located a particular quantity of bits after the first header bit which particular quantity equals said header+exec constant minus one. Being able to locate said last bit, said apparatus can automatically locate the next instance of header information in a fashion described below.

For messages whose elements include intermediate priority segment information but no lowest priority segment information, the information of said messages is also sufficient to distinguish message structure and the location of the next header. In the simplest preferred embodiment, each message associated with an "00" header is one such message. Messages with "00" headers consist of header and execution segment information that are, together, of said header+exec constant length plus meter-monitor segment information that contains length token information. By preprogramming subscriber station apparatus with information for processing length token information, the present invention enables said apparatus to determine the particular information bit, following any instance of a "00" header, that is the last bit of the command of said header. Said bit is always the bit that is located a particular quantity of bits after the first header bit which quantity equals said header+exec constant minus one plus the particular preprogrammed quantity that said apparatus associates, in a preprogrammed fashion described more fully below, with the particular length token of said instance. By locating said last bit, said apparatus can automatically locate the next instance of header information in the fashion described below.

For messages whose elements include lowest priority segment information, particular end of lowest priority segment information is required to distinguish full message structure and the location of the next header. In the simplest preferred embodiment, each message associated with a "01" or a "11" contains an information segment header and is one such message. Information segments vary in length, and no internal information of a command or information segment enables subscriber station apparatus to determine the length of an information segment. Thus distinctive end of file signals are required to communicate the locations of the ends of information segments to subscriber station apparatus. In the present invention, each end of file signal is transmitted immediately after the end of an information segment; said signal is part of the information of the message in which said segment occurs; and said signal is located at the end of said message. By preprogramming subscriber station apparatus to detect and process end of file signals in a fashion described more fully below, the present invention enables said apparatus to determine not only the particular information bit, following any instance of a "01" or "11" header, that is the last bit of the information segment of the message of said header but also the particular information bit, following said header, that is the last bit of said message. By locating said last bit of said message, said apparatus can automatically locate the next instance of header information in the fashion described below.

At any given time, subscriber station apparatus are preprogrammed to process only one distinct signal as an end of file signal. In order for

said apparatus to distinguish an instance of said signal from all other signal information, an end of file signal must differ distinctly from all other information. Signal information, especially information transmitted in an information segment, can vary greatly in composition. Accordingly, to be distinctive, an end of file signal must be long and complex to detect.

An end of file signal consists of a particular sequence of bits of binary information. In the preferred embodiment each bit is identical to every other bit; that is, disregarding error correction information, an end of file signal consists of a sequence of "1" bits (eg. "11111111") or "0" bits (eg. "00000000"). In the preferred embodiment, end of file signals are composed of "1" bits rather than "0" bits. Zero is a value that occurs frequently in data and in mathematics, and however many bits may occur in a binary data word that consists of a series of "0" bits, the numeric value of said word remains zero. Numeric values that are represented in binary form by a sequence of "1" bits, especially a sequence that is long, occur in data and mathematics far less frequently than zero. Thus the preferred composition bit is "1" because the chance of data being joined in a given signal in such a way that two or more instance of information combine inadvertently and create the appearance of an end of file signal is far smaller if the preferred bit is "1" than if it is "0". (Hereinafter, the preferred binary end of file signal composition bit, "1", is called an "EOFS bit," and for reasons that are explained below, the alternate binary bit, "0", is called a "MOVE bit.")

In the preferred embodiment, the length of said sequence (disregarding error correction information) is the minimum reasonable length necessary to distinguish said sequence from all other sequences of transmitted signal information of said length. In the preferred embodiment, the number of bits in said sequence is greater than the number of information bits in the data words that subscriber station computers use to process data. At present, most computers are so-called "thirty-two bit machines" that process information in four-byte data words, and some high precision microprocessors such as the 8087 mathematics coprocessor distributed by the Intel Corporation of Santa Clara, Calif., U.S.A. process information internally in eighty bit registers which means that they process in 10-byte data words. Thus said sequence may be greater than eighty bits long and is probably greater than thirty-two bits. Also in the preferred embodiment, said sequence uses the full information capacity of the signal words used to communicate said sequence at subscriber stations. In computer systems that communicate information in eight-bit bytes, forty bits is the number of bits in the sequence next larger than thirty-two bits that uses the full communication capacity of the signal words in which it is communicated, and eighty-eight is the number of bits in the sequence next larger than eighty bits. In the preferred embodiment, at any given time alternate end of file signal lengths exist. One potential end of file signal length can be forty (40) bits which is five bytes of EOFS bits. Another can be eighty-eight (88) bits which is eleven bytes of EOFS bits. Which end of file signal is used for any given transmission depends on the nature of the information of the transmission in which said signal occurs and the apparatus to which said transmission is transmitted.

Being the minimum "reasonable" length means that an instance of said sequence may actually be generated, in the system of the preferred embodiment, which instance is generated as information of a command or an

information segment rather than an end of file signal. Were the information of said instance to be embedded in a SPAM transmission of said system and transmitted, said instance would cause erroneously processing at subscriber station apparatus by causing itself to be detected as an end of file signal and information transmitted subsequent to said instance to be interpreted as a new SPAM message. To prevent such erroneous processing, in the preferred embodiment, after the initial generation of any given instance of SPAM message information (not including end of file signal information) and before the embedding and transmitting of said instance, said information is transmitted through an apparatus, called an "EOFS valve," that detects end of file signals and is described below. If said valve detects in said information particular information that constitutes an end of file signal, before being embedded and transmitted, the binary information of said instance is rewritten, in a fashion well known in the art that may be manual, to cause substantively the same information processing at subscriber stations without containing an instance of information that is identical to the information of an end of file signal. (Hereinafter, such pre-transmission processing of a message is called a "pre-transmission evaluation.")

FIG. 2I shows a series of connected rectangles and depicts one instance of a stream of SPAM messages. Each rectangle represents one signal word of binary information. FIG. 2I shows a series of three messages. Each message is composed in a whole number of signal words. The first message consists of a command followed by padding bits followed by an information segment followed by an end of file signal. The form of the command, padding bits, and the first information segment bits of said message is identical to the form of the information of FIG. 2E, given eight-bit bytes as the signal words of FIG. 2I. The second message consists of a command followed by padding bits. The form of said second message is identical to the form of the information of FIG. 2H, given eight-bit bytes as the signal words of FIG. 2I. The third message consists of a command alone. The form of said third message is identical to the form of the information of FIG. 2J, given eight-bit bytes as the signal words of FIG. 2I. FIG. 2J shows a message that is composed just of a "10" header and an execution segment. Said execution segment contains the same number of binary bits that the executions segments of FIGS. 2E and 2H contain. Said header and execution segment of FIG. 2J fill one byte of binary information precisely, and given the signal word of an eight-bit byte, no padding bits are required in the message of FIG. 2J. FIG. 2H does not show an instance of a message that starts with a "11" header. Were it to do so, said message would be comprised of said header followed by six padding bits, given eight-bit bytes as the signal words of FIG. 2I, followed by an information segment, like the information segment of the first message of FIG. 2H, followed by an end of file signal, like the end of file signal of said first message.

As FIG. 2I shows, in any given SPAM transmission, no binary information separates the binary information of one SPAM message from the next message. As soon as the information of one SPAM message ends (including all error correction information associated with said information), the next received binary information is information of the next message. Because the first information bits (as distinct from error correction bits) of any given SPAM message constitute the header information of said message, subscriber station apparatus locate the next instance of header information after any given message by locating the last information bit of the last signal word of said message. Automatically the first

information bits that follow said last bit and total in number the particular number of bits in an instance of header information constitute the next instance of header information.

Subscriber station apparatus locate the last information bit of any given SPAM message in one of two fashions. One fashion applies to messages that do not end with end of file signals. The other applies to messages that do. The header information of any given message determines which fashion applies for said message.

Messages that are constituted only of first priority segment elements and messages whose elements include intermediate priority segment information but no lowest priority segment information do not end with end of file signals. In the preferred embodiment, the header information of any given one of said messages cause subscriber station apparatus to execute particular preprogrammed locate-last-message-bit instructions at a particular time. In the simplest preferred embodiment, such messages begin with "10" or "00" headers.

Receiving any given instance of said header information causes subscriber stations processing message information of said instance to execute said locate-last-message-bit instructions after locating the last segment information bit of said instance and upon completing the processing of the segment information of said instance. (The fashions whereby subscriber station apparatus locate the last command information bit of any given instance of a message with a "10" or a "00" header are described above.) In a fashion that is described more fully below, said locate-last-message-bit instructions cause said apparatus to determine whether the signal word in which said last segment information bit occurs contains one or more MOVE bits. If said signal word contains MOVE bit information, the last information bit of said signal word is the last information bit of said message. If said signal word does not contain MOVE bit information, the last information bit of said message is last information bit of the next signal word immediately following said signal word in which said last segment information bit occurs. (For reasons that relate to detecting end of file signals and are discussed more fully below, in the preferred embodiment a complete signal word of padding bits is transmitted after any given instance of a signal word that contains no MOVE bit information and in which occurs the last bit of command information of the message of said instance.)

Messages that contain lowest priority segment information end with end of file signals, and the header information of said messages do not cause subscriber station apparatus to execute particular preprogrammed locate-last-message-bit instructions. End of file signals define the ends of messages that contain lowest priority segment information. In the simplest preferred embodiment, such messages begin with "10" or "00" headers. The last information bit of the end of file signal immediately following any given "10" or "00" header information message is the last information bit of the message of said "10" or "00" header, and subscriber station apparatus are preprogrammed to locate said bit in a fashion that is described below.

After locating any given instance of a last information bit of a message, subscriber station apparatus are preprogrammed to process automatically as header information the first information bits, following said bit, that are in number the particular number of bits in an instance

of header information.

In this fashion, cadence information--header information, the length tokens of messages that contain intermediate priority segment information but no lowest priority segment information, and end of file signals--enables subscriber station apparatus to distinguish each instance of header information--and, hence, each message--in any given stream of SPAM messages.

DETECTING END OF FILE SIGNALS

In the present invention, any microprocessor, buffer/comparator, or buffer can be adapted and preprogrammed to detect end of file signals. At any given SPAM apparatus that is so adapted and preprogrammed, particular dedicated capacity exists for said detecting. Said capacity includes standard register memory or RAM capacity, well known in the art, including three particular memory locations for comparison purposes, one particular memory location to serve as a counter, and three so-called "flag bit" locations to hold particular true/false information. (Hereinafter, said three particular memory locations, said one particular memory location, and said three flag bit locations are called the "EOFS Word Evaluation Location," "EOFS Standard Word Location," and "EOFS Standard Length Location"; the "EOFS WORD Counter"; and the "EOFS WORD Flag," "EOFS Empty Flag," and "EOFS Complete Flag" all respectively.) All operating instructions required to control said memory or RAM capacity in detecting end of file signals are preprogrammed as so-called "firmware" at said apparatus. (In this specification, said dedicated capacity is called an "EOFS valve" because, in addition to detecting end of file signals, said capacity also regulates the flow of SPAM information in fashions that are described more fully below.)

At any given EOFS valve, the EOFS Word Evaluation Location and EOFS Standard Word Location are conventional dynamic memory locations each capable of holding one full signal word of binary information. The EOFS Standard Length Location and the EOFS WORD Counter are each conventional dynamic memory locations capable of holding, at a minimum, eight binary bits--that is, one byte--of information. The EOFS WORD Flag, EOFS Empty Flag, and EOFS Complete Flag are each conventional dynamic memory locations capable of holding, at a minimum, one bit of binary information.

At any given time, said valve holds particular information. At said EOFS Word Evaluation Location is one signal word of received SPAM information. At said EOFS Standard Word Location is one signal word of EOFS bits. (Hereinafter, one signal word of EOFS bits is called an "EOFS WORD.") At said EOFS Standard Length Location is information of the total number of EOFS WORDs in the particular end of file signal that applies at said time on the particular transmission received at said valve. Information of the decimal value, eleven, is at said Standard Length Location unless information of a number is placed at said Location in a fashion described below. At the EOFS WORD Counter is information of the number of EOFS WORDs that said valve has received in uninterrupted sequence. And all said Flag locations contain binary "0" or "1" information to reflect true or false conditions in relation to particular comparisons.

At any given time, any given EOFS valve receives inputted binary information of one selected SPAM transmission from one particular

external transferring apparatus that is external to said valve. Said information consists of a series of discrete signal words. And said valve outputs information to one particular external receiving apparatus.

Receiving any given signal word of said transmission, causes said EOFS valve to commence, in respect to said given signal word, a particular word evaluation sequence that is fully automatic. Automatically said valve places information of said word at said EOFS Word Evaluation Location and compares the information at said Location to the EOFS WORD information at said EOFS Standard Word Location. Whenever said comparison is made, resulting in a match causes said valve automatically to set the information of said EOFS WORD Flag to "0". (Resulting in a match means that said given signal word is an EOFS WORD and may be a part of an end of file signal.) Not resulting in a match causes said valve automatically to set the information of said EOFS WORD Flag to "1". Then automatically said valve determines the value of said information at said EOFS WORD Flag, in a fashion well known in the art, and executes one of two sets of word evaluation sequence instructions on the basis of the outcome of said determining.

One set, the process-EOFS-WORD instructions, is executed whenever the information at said EOFS WORD Flag indicates that said given signal word is an EOFS WORD. Determining a value of "0" at said EOFS WORD Flag causes said valve to execute said set. Automatically the instructions of said set cause said valve to retain count information of said given signal word by increasing the value of the information at said EOFS WORD Counter by an increment of one. (Incrementing said Counter by one documents the fact that, in receiving said given signal word, said valve has received, in uninterrupted sequence, one signal word that may be part of an end of file signal more than it had received before it received said given signal word.) Then automatically said valve compares the information at said EOFS WORD Counter to the information at said EOFS Standard Length Location. Resulting in a match causes said valve automatically to set the information of said EOFS Complete Flag to "0". (A match of the information at said Counter with the information at said Location means that said given signal word is the last EOFS WORD in an uninterrupted sequence of EOFS WORDS that equals in length the length of an end of file signal; in other words, said match means that an end of file signal has been detected.) Not resulting in a match causes said valve automatically to set the information of said EOFS Complete Flag to "1". (Not resulting in a match means said EOFS WORD is not the last EOFS WORD of an end of file signal and that insufficient information has been received to determine whether or not said given signal word is part of an end of file signal.) Then automatically said valve determines the value of said information at said EOFS Complete Flag. Determining a value of "0" at said Flag, which means that an end of file signal has been detected, causes said valve to operate in a fashion described more fully below. Determining a value of "1" at said Flag causes said valve, in a fashion described more fully below, to complete said word evaluation sequence, in respect to said given signal word, without transferring any information of said given signal word to said external receiving apparatus.

The other set, the transfer-all-word-information instructions, is executed whenever the information at said EOFS WORD Flag indicates that said given signal word is not an EOFS WORD. Whenever said valve detects a signal word that is not an EOFS WORD, detecting said word means not only that said word is not part of an end of file signal but also that any

EOFS WORDs retained in an uninterrupted sequence immediately prior to said word are also not part of an end of file signal. Determining a value of "1" at said EOFS WORD Flag causes said valve to execute said other set. Automatically the instructions of said other set cause said valve to compare the information at said EOFS WORD Counter to particular zero information that is among the preprogrammed information of said valve. (Not having been incremented by one under control of said process-EOFS-WORD instructions, said Counter contains information of the number of EOFS WORDs received in an uninterrupted sequence and retained at said valve at the time when said given signal word is received.) Resulting in a match causes said valve automatically to set the information of said EOFS Empty Flag to "0". (Resulting in a match means that said valve is empty of retained EOFS WORD information.) Not resulting in a match causes said valve automatically to set the information of said EOFS Empty Flag to "1". (Not resulting in a match means that said valve contains information of EOFS WORDs that have not been transferred to said external receiving apparatus.) Then automatically said valve determines the value of said information at said EOFS Empty Flag. A determining of "1" causes said valve to execute particular transfer-counted-information instructions that are not executed if the information at said Flag is "0". Under control of said instructions, said valve automatically outputs one instance of said EOFS WORD information at said EOFS Standard Word Location a particular number of times which particular number is the numerical value of the information at said EOFS WORD Counter. (In so doing, said valve transfers information of all of the signal words received before said given signal word and not transferred to said external receiving apparatus.) Then said transfer-counted-information instructions cause said valve to set the value at said EOFS WORD Counter to zero (to reflect that said valve is now empty of information of untransferred signal words). Then, whether or not said valve has executed said transfer-counted-information instructions, said valve outputs information of said given signal word at said EOFS Word Evaluation Location and completes said word evaluation sequence, in respect to said given signal word.

Whenever said valve completes said word evaluation sequence, in respect to any given signal word, said valve informs said external transferring apparatus (in a so-called "handshaking" fashion, well known in the art, or in such other flow control fashion as may be appropriate) that said valve is ready to receive next signal word information. Whenever, after transferring a given signal word, said apparatus is so informed, said apparatus transfers to said decoder the next signal word of said transmission immediately following said given signal word. Receiving said next signal word causes said valve to commence said word evaluation sequence, in respect to said next signal word. Automatically said valve places information of said next signal word at said EOFS Word Evaluation Location, and in so doing, overwrites and obliterates information of said given word at said EOFS Word Evaluation Location.

In this fashion, said valve processes each successive signal word to detect those particular uninterrupted series of EOFS WORDs that constitute end of file signals.

As described above, determining, under control of said process-EOFS-WORD instructions, that the value of the information at said EOFS Complete Flag is "0" means that an end of file signal has been detected. Determining, under control of said instructions, that said value is "0"

causes said valve to execute particular complete-signal-detected instructions. Said instructions cause said valve to inform said external receiving apparatus of the presence of an end of file signal in a fashion that is the preprogrammed fashion of the microprocessor, buffer/comparator, or buffer of which said valve is an adapted component.

As one example of said fashion, for a buffer or buffer/comparator apparatus that operates under control of a controller to process received signal words and transfer signal information to a microprocessor (which may be a component of said controller), said instructions cause said valve to cause said apparatus to transmit particular EOFS-signal-detected information to said controller then to wait, in a waiting fashion well known in the art, for a control instruction from said controller. Said EOFS-signal-detected information causes said controller to determine, in a preprogrammed fashion, how to process the particular EOFS information at said valve and to transmit either a particular transmit-and-wait instruction or a particular discard-and-wait instruction to said valve. (Examples of controller operations are presented below.) Said transmit-and-wait instruction causes said valve to transfer one complete end of file signal. More precisely, said instruction causes said valve automatically to output one instance of said EOFS WORD information at said EOFS Standard Word Location a particular number of times which particular number is the numerical value of the information at said EOFS Standard Length Location. Then automatically said valve sets the information at said EOFS WORD Counter to zero (thereby signifying that no EOFS WORDs are retained), completes said word evaluation sequence, in respect to the signal word of the information at said EOFS Word Evaluation Location, and transmits particular complete-and-waiting information to said controller. Alternatively, said discard-and-wait instruction causes said valve merely to set the information at said EOFS WORD Counter to zero (thereby discarding information of said end of file signal), to complete said word evaluation sequence, in respect to said signal word of the information at said EOFS Word Evaluation Location, and to transmit said complete-and-waiting information to said controller. Subsequently, said complete-and-waiting information causes said controller to transmit further instructions that control said apparatus and said valve in the processing of further information and the detecting of further end of file signals.

In the preferred embodiment, said EOFS-signal-detected information and said complete-and-waiting information are control signals that are transmitted by said valve and said apparatus to said controller as interrupts to the CPU of said controller.

An example illustrates the operation of an EOFS valve.

FIG. 2 shows one message that is of a particular command composed of a "00" header, an execution segment, and a meter-monitor segment. The information of said command fills four bytes of binary precisely. The last bit of said meter-monitor segment is the last bit of the fourth byte of said command. But because the byte in which said last bit occurs contains no MOVE bit information, according to the rules of message composition of the preferred embodiment, one full signal word of padding bits follows said command.

When the message of FIG. 2 is transmitted, a given EOFS valve receives the transmission of said message from a particular transferring apparatus

and transfers information to a particular receiving apparatus. Said valve is adapted and preprogrammed to process eight-bit bytes as signal words. The information at the EOFS Standard Word Location of said valve is the EOFS WORD of the preferred embodiment: "11111111". The EOFS Standard Length Location and EOFS WORD Counter of said valve each hold one byte of binary information. The binary information at said EOFS Standard Length Location is "00001011", a binary number whose decimal equivalent is eleven. The binary information at said EOFS WORD Counter is "00000000", a binary number whose decimal value is zero.

Receiving the first byte of said message causes said valve to place information of said byte at said EOFS Word Evaluation Location and to compare the information at said Location, "10010100", to the EOFS WORD information at said EOFS Standard Word Location, "11111111". No match results which causes said valve automatically to set the information of said EOFS WORD Flag to "1". Automatically said valve determines the value of said information at said Flag is "1" which causes said valve to execute said transfer-all-word-information instructions. Automatically said valve compares the information at said EOFS WORD Counter, zero, to said zero information that is among the preprogrammed information of said valve. (The binary value of each instance of zero information is "00000000".) A match results which causes said valve automatically to set the information of said EOFS Empty Flag to "0". Automatically said valve determines that the value of said information at said EOFS Empty Flag is "0" and skips executing said transfer-counted-information instructions. Automatically said valve continues executing conventional ones of said transfer-all-word-information instructions; transfers information of said first byte at said EOFS word evaluation location--which information is "10010100"--to said receiving apparatus; completes said word evaluation sequence, in respect to said first byte; and transfers handshake information to said transferring apparatus that informs said apparatus that said valve is ready to receive next signal word information.

Receiving said handshake information causes said transferring apparatus to transfer the next byte of said message to said valve.

Receiving said next byte, which is the second byte, causes said valve to place information of said byte at said EOFS Word Evaluation Location and to compare the information at said Location, "11001000", to the EOFS WORD information at said EOFS Standard Word Location, "11111111". No match results which causes said valve to set the information of said EOFS WORD Flag to "1". Automatically said valve determines that the information at said Flag is "1" which causes said valve to execute said transfer-all-word-information instructions. Automatically said valve compares the information at said EOFS WORD Counter, zero, to said zero information that is among the preprogrammed information of said valve. A match results which causes said valve to set the information of said EOFS Empty Flag to "0". Automatically said valve determines that the information at said EOFS Empty Flag is "0". Automatically said valve continues executing conventional transfer-all-word-information instructions; transfers information of said second byte at said EOFS word evaluation location--which information is "11001000"--to said receiving apparatus; completes said word evaluation sequence, in respect to said second byte; and informs said transferring apparatus that said valve is ready to receive next signal word information which causes said apparatus to transfer to said valve the next byte of said message.

Receiving said next byte, which is the third byte, causes said valve to place information of said byte at said EOFS Word Evaluation Location and to compare the information at said Location, "11111111", to the EOFS WORD at said EOFS Standard Word Location, "11111111". A match results, causing said valve to set the information of said EOFS WORD Flag to "0". Automatically said valve determines that the information at said Flag is "0" which causes said valve to execute said process-EOFS-WORD instructions. Automatically, in a fashion well known in the art, said valve increases the value of the information at said EOFS WORD Counter by an increment of one from "00000000" to "00000001". Automatically said valve compares the information at said EOFS WORD Counter, "00000001", to the information at said EOFS Standard Length Location, "00001011". No match results which causes said valve automatically to set the information of said EOFS Complete Flag to "1". Automatically said valve determines that the value of said information at said EOFS Complete Flag is "1" which causes said valve automatically to complete said word evaluation sequence, in respect to said third byte, without transferring any information of said byte to said receiving apparatus. Automatically said valve then informs said transferring apparatus that said valve is ready to receive next signal word information which causes said apparatus to transfer to said valve the next byte of said message.

Receiving said next byte, which is the fourth byte, causes said valve to place information of said byte at said EOFS Word Evaluation Location, which information is "11111111". In so placing said information at said Location, said valve automatically overwrites and obliterates the information of the third byte that had been at said Location. Automatically said valve then compares the information at said Location, "11111111", to the EOFS WORD information at said EOFS Standard Word Location, "11111111". A match results, causing said valve to set the information of said EOFS WORD Flag to "0". Automatically said valve determines that the information at said Flag is "0", which causes said valve to increase the value of the information at said EOFS WORD Counter from "00000001" to "00000010", a binary number whose decimal equivalent is two. Automatically said valve compares said "00000010" to the information at said EOFS Standard Length Location, "00001011". No match results which causes said valve to set the information of said EOFS Complete Flag to "1". Automatically said valve determines that the value of said information at said EOFS Complete Flag is "1" which causes said valve to complete said word evaluation sequence, in respect to said fourth byte, without transferring any information of said byte to said receiving apparatus. Automatically said valve then informs said transferring apparatus that said valve is ready to receive next signal word information which causes said apparatus to transfer to said valve the next byte of said message.

Receiving said next byte, which is the fifth and last byte, causes said valve to place information of said byte at said EOFS Word Evaluation Location, which information is "00000000". In so placing said information at said Location, said valve automatically overwrites and obliterates the information of the fourth byte at said Location. Automatically said valve then compares the information at said Location, "00000000", to the EOFS WORD information at said EOFS Standard Word Location, "11111111". No match results which causes said valve to set the information of said EOFS WORD Flag to "1". Automatically said valve determines that the information at said Flag is "1" which causes said valve to execute said transfer-all-word-information instructions. Automatically said valve

compares the information at said EOFS WORD Counter, "00000010", to said zero information, "00000000", that is among the preprogrammed information of said valve. No match results which causes said valve to set the information of said EOFS Empty Flag to "1". Automatically said valve determines that the information at said EOFS Empty Flag is "1" which causes said valve to execute said transfer-counted-information instructions. Said instructions cause said valve automatically to transfer one instance of said EOFS WORD information at said EOFS Standard Word Location, "11111111", to said receiving apparatus then decrease the value of the information at said EOFS WORD Counter by a decrement of one--that is, from "00000010" to "00000001"--then compare the information at said EOFS WORD Counter to said zero information, "00000000". Because no match occurs, said valve automatically transfers one more instance of said EOFS WORD information, "11111111", to said receiving apparatus then decreases the value of the information at said EOFS WORD Counter by an additional decrement of one--that is, from "00000001" to "00000000"--then compares said information to said zero information, "00000000". A match occurs. In a fashion well known in the art, the fact of said match causes said valve automatically to continue executing transfer-all-word-information instructions. Automatically said valve transfers information of said fifth byte at said EOFS word evaluation location--which information is "00000000"--to said receiving apparatus; completes said word evaluation sequence, in respect to said fifth and last byte of the message of FIG. 2K; and informs said transferring apparatus that said valve is ready to receive next signal word information which causes said apparatus to transfer to said valve the next byte of said message as soon as said apparatus receives and is prepared to transfer said byte.

The example of FIG. 2K illustrates how receiving each signal word causes an EOFS valve to evaluate the information content of said word; to transfer words that are not EOFS WORDs; to retain count information of words that are EOFS WORDs so long as said words occur in uninterrupted sequences of EOFS WORDs which sequences are shorter than the number of EOFS WORDs in an instance of end of file signal information; and when receiving any given signal word that is not an EOFS WORD interrupts such a sequence, to transfer information of each retained EOFS WORD before transferring information of said given signal word. The example of FIG. 2K does not illustrate the detecting of an end of file signal; however, an example of such detecting is provided below.

In this specification, MOVE bits are called "MOVE" bits because MOVE bit information in any given signal word causes each EOFS valve that processes the information of said word to "move"--that is, to transfer--information of said word to receiving apparatus external to said valve during the word evaluation sequence of said word rather than retaining said information.

Reasons should now be clear why padding bits are always MOVE bits and why, in a SPAM message, a full signal word of padding bits follows a signal word that is the last signal word in which command information occurs and that contains no MOVE bits. The command of FIG. 2K is such a command, and the fourth byte is such a word. In its automatic fashion for identifying end of file signals, no EOFS valve that receives said fourth byte transfers said byte until it receives a subsequent signal word that contains a MOVE bit. In the present invention there is no assurance that every EOFS valve immediately receives a next signal word as soon as it completes the word evaluation sequence, in respect to any given signal

word. Thus to ensure that all apparatus to which messages are addressed process message information in the fastest possible fashion, all messages that do not end with end of file signals do end with signal words that contain at least one MOVE bit.

One final rule of message composition remains. In order to define end of file signals precisely, a signal word that contains at least one MOVE bit is always transmitted immediately before the uninterrupted sequence of EOFS WORDs of any given end of file signal. Were a given signal word that contained no MOVE bits to be transmitted immediately before the uninterrupted sequence of a given end of file signal, said word would contain only EOFS bits and would be an EOFS WORD. Any EOFS valve processing said word and said signal would process said word as one of the EOFS WORDs of said uninterrupted sequence. Said valve would count said word erroneously as part of said sequence rather than as part of the information preceding said sequence and would count at least the last EOFS WORD of said sequence erroneously as part of the message following said signal rather than as part of said signal. In order to avoid such erroneous processing, any given instance of the uninterrupted sequence of EOFS WORDs of an end of file signal is preceded by signal word that is not an EOFS WORD.

This final rule may be satisfied in a number of different ways. For example, end of file signals could include the signal word preceding said uninterrupted sequence. Rather than being an uninterrupted sequence of eleven EOFS WORDs, an end of file signal could be twelve words long with the first word containing MOVE bit information. And subscriber station apparatus could be adapted and preprogrammed for detecting such signals.

As related above, in the preferred embodiment, end of file signals are composed just of the uninterrupted sequence of EOFS WORDs described above, and the signal words that precede said sequences are part of the last segment information preceding said signals. To prevent erroneous processing while satisfying the final rule of message composition, in any given pre-transmission evaluation of an instance of SPAM message information, if the EOFS valve of said evaluation retains information the last signal word of said information in the course of the word evaluation sequence of said word rather than transferring information of said word, the binary information of said instance is rewritten, in a fashion well known in the art that may be manual, before being embedded and transmitted. Said binary information is rewritten to end with a final signal word that contains MOVE bit information and still cause substantively the same information processing at subscriber stations.

In this fashion, the signal information of any given end of file signal is distinctive, and EOFS detectors detect end of file signals precisely.

Despite the fact that the use of end of file signals involves time consuming processing, the preferred embodiment's system for distinguishing individual messages from one another in message streams has significant advantages over alternate techniques.

By comparison with systems that process fixed length and/or fixed format messages, the use of end of file signals permits great flexibility. Messages can be of any length and can contain any information that digital receiver station apparatus can process.

By comparison with systems that distinguish messages from one another by means of distinctive signals that separate the end of each message from the beginning of the next, end of file signals are used in the preferred embodiment only with some messages. Many messages, such as the second and third messages of the message stream of FIG. 2I, do not require end of file signals. Furthermore, as will become more apparent in the course of this specification, messages that consist of commands alone often have higher priority for processing speed than do the messages that contain last segment information. Since only messages that contain last segment information require end of file signals, end of file signals are often transmitted and processed at times when speed of processing is of relative unimportance.

Finally, because long cadence signals are processed at ends of messages rather than at beginnings, the preferred embodiment reduces the relative importance of the processing speed associated with such signals even further. In the preferred embodiment, subscriber station apparatus have capacity for commencing to process received command and information segment information before receiving the end of file signal associated with said information. The commencement of processing of the command and information segment information of any given message need never be delayed until after an end of file signal, associated with said message, is detected.

The preferred embodiment has the advantage of requiring that long cadence signals that require time consuming processing be transmitted only with some messages and then only at times when processing speed is of relatively low priority. In so doing, the preferred embodiment makes it possible to transmit in the shortest, simplest formats messages that have high priority for processing speed and to process said messages the fastest fashion.

The Normal Transmission Location

SPAM signals are generated at original transmission stations or intermediate transmission stations and embedded in television or radio or other programming transmissions by conventional generating and embedding means, well known in the art. Said signals may be embedded in transmissions at said stations immediately prior to transmitting said transmissions via conventional broadcast or cablecast means, well known in the art. Alternatively, said signals may be embedded in transmissions that are then recorded, in a fashion well known in the art, on an appropriate conventional video, audio or other record media. Playing back said media on appropriate player apparatus will cause said apparatus to retransmit said transmissions with said SPAM signals embedded precisely as they were embedded when said transmissions were recorded.

SPAM signals can be embedded in many different locations in electronic transmissions. ~~All received programing is analyzed and evaluated by~~In television, SPAM signals can be embedded in the video portion or in the audio portion of the transmission. In the video portion, SPAM signals can be embedded in each frame on one line such as line 20 of the vertical interval, or on a portion of one line, or on more than one line, and they will probably lie outside the range of the television picture displayed on a normally tuned television set. SPAM signals can be embedded in radio audio transmissions. In the audio of television and radio transmissions, SP.AM signals will probably be

embedded in a portion of the audio range that is not normally rendered in a form audible to the human ear. In television audio, they are likely to lie between eight and fifteen kilohertz. In broadcast print and data communications transmissions, SPAM signals can accompany conventional print or data programming in the conventional transmission stream.

In television, the normal transmission location of the preferred embodiment is in the vertical interval of each frame of the television video transmission. Said location begins at the first detectable part of line 20 of the vertical interval and continues to the last detectable part of the last line of the vertical interval that is not visible on a normally tuned television set.

In radio, the preferred normal transmission location is in the audio above the range of the radio transmission that is normally audible to the human ear.

In broadcast print or data communications, the preferred normal transmission location for SPAM signals is in the same location as the conventional information. More precisely, conventional print of data information is transmitted in SPAM transmissions. Any given instance of conventional print or data information is transmitted in a SPAM information segment that is preceded by a "01" header SPAM command or a "11" header, which command or header addresses conventional print or data processing apparatus at subscriber stations and causes said apparatus to process said conventional information in the conventional fashion. In said transmissions, other SPAM commands and information address and control subscriber station apparatus in other SPAM functioning.

(Hereinafter, the preferred normal location for transmitting signals in any given communication medium is called, the "normal transmission location".)

In the preferred embodiment, while receiver station decoder apparatus may be controlled, in fashions described below, to detect information segment information outside the normal transmission locations, SPAM commands and cadence information are always transmitted in normal transmission locations. In the present invention, the object of many decoders is to detect only command information such as meter-monitor segment information. Having one unchanging location for the transmission of command information in any given television, radio, broadcast print, or data transmission permits decoder apparatus to search just one unchanging portion of said transmission to detect commands. Having the same fixed location for cadence information enables said decoder apparatus to distinguish all command information in said transmission.

Operating Signal Processor Systems . . . Introduction

Five examples illustrate methods of operating signal processing system apparatus. Each focuses on subscriber stations where the signal processor system of FIG. 2D and the combined medium apparatus of FIG. 1 share apparatus and operate in common.

FIG. 3 shows one such subscriber station. In FIG. 3, the decoder, 203, of FIG. 1 is also an external decoder of the signal processor system of signal processor, 200. Like decoders, 27, 28, and 29, in FIG. 2D, ~~Working with microcomputer, 205, which is~~

~~preprogramed to present received programing in predetermined fashions~~decoder, 203, has capacity for transferring SPAM information to ~~determined at the receiver site,~~buffer/comparator, 8, of signal processor, 200, ~~permits and~~and to buffer/comparator, ~~facilitates such presentations in accordance with the intentions of the~~14. In addition, signal processor, 200, has capacity for transferring SPAM signals from a particular jack port of controller, 12, to microcomputer, 205.

FIG. 3 also shows SPAM-controller, 205C, to which signals that are addressed to URS microcomputers, 205, are transferred from decoder, 203, and from signal processor, 200. SPAM-controller, 205C, is a control unit like controller, 39, of decoder, 203, with buffer capacity for receiving multiple inputs; RAM and ROM for holding operating instructions and other information; EOFS valve capacity for detecting end of file signals and regulating the flow of SPAM signals; microprocessor capacity for processing; capacity for transferring information to and receiving information from the central processor unit (hereinafter, "CPU") of microcomputer, 205; and capacity for transferring information to one or more input buffers of microcomputer, 205. SPAM-controller, 205C, operates independently of said CPU although said CPU has capacity to interrupt SPAM-controller, 205C, in an interrupt fashion well known in the art. SPAM-controller, 205C, also has capacity to control directly to the aforementioned PC-MicroKey 1300 System without affecting the operation of said CPU.

All five examples describe signal processing variations that relate to the FIG. 1C combining of "One Combined Medium."

The first focuses on the basic operation, in "One Combined Medium," of decoder, 203; SPAM-controller, 205C; and microcomputer, 205. No signals require decryption. No meter information is collected. No monitor information is processed. Combined information is displayed at each subscriber station.

In the second example, the combining of FIG. 1C occurs only at selected subscriber stations. The second combining synch command is partially encrypted, and said stations are preprogrammed with particular information that is necessary to decrypt said command. At said stations, said command causes its own decryption and the combining of FIG. 1C. In addition, said command causes signal processor apparatus at said stations to retain meter information that a remote billing agency can use as a basis for charging the subscribers of said stations for displaying the combined information of said combining. At all other stations, no information is decrypted, no combining occurs, and no meter information is collected.

In the third example, combined information is displayed at each subscriber station just as in the first example. In addition, monitor information is processed at selected stations for one or more so-called "ratings" agencies (such as the A. C. Nielsen Company) that collect statistics on viewership and programming usage.

The fourth example provides a second illustration of restricting the combining of FIG. 1C to selected subscriber stations through the use of encryption/decryption techniques and metering. In addition, the fourth example shows how monitor information is collected at selected ones of

said selected stations.

The fifth example adds program unit identification signals identified at decoders, 30 and 40, of signal processor, 200.

In the last three examples, the first combining synch command causes selected subscriber stations to transfer recorded meter information and monitor information to one or more remote computer stations of said billing agencies and ratings agencies and causes computers at said remote agencies to receive and process said transferred information.

Each example focuses on the processing of the three signal messages of the FIG. 1C combining. The information of said messages include three combining synch commands and one program instruction set.

The first message is of the information associated with the first combining synch command. Said first command has a "01" header, an execution segment, and a meter-monitor segment of six fields. Said command is followed by an information segment that contains said program instruction set, and said information segment is followed by an end of file signal. Said first command addresses URS microcomputers, 205, and causes said computers, 205, to load and run the program instruction set transmitted in the information segment. Each meter-monitor segment field of said command contains information that identifies one of the following:
.cndot. the origin of said "Wall Street Week" transmission,
.cndot. the subject matter of said "Wall Street Week" program,
.cndot. the program unit of said program,
.cndot. the day of said transmission within a particular one hundred year period,
.cndot. the supplier of the program instruction set in the information segment following said first combining synch command, and
.cndot. the format of said meter-monitor segment information.
(Hereinafter, meter-monitor information that identifies the program unit of a given program may also be called the "program unit identification code".)

The second message is of the information associated with the second combining synch command. Said second command has a "00" header, an execution segment, and a meter-monitor segment of five fields and addresses URS microcomputers, 205. Said second command causes said computers, 205, to combine the FIG. 1A information of each microcomputer, 205, with the information of FIG. 1B and transmit the combined information to monitors, 202M. Each meter-monitor segment field of the second command contains information of one of the following:
.cndot. the subject matter of said "Wall Street Week" program,
.cndot. the program unit of said program,
.cndot. the unique code of said overlay given said program unit information,
.cndot. the minute of said transmission within a particular one month period, and
.cndot. the format of said meter-monitor segment information.

The third message is of the information associated with the third combining synch command. Said third command has only a "10" header and an execution segment and addresses URS microcomputers, 205. Said command causes said computers, 205, to cease combining and transmit only the

received composite video transmission to monitors, 202M, and to continue processing in a predetermined fashion (which fashion may be determined by the aforementioned program instruction set).

In those examples that focus on encrypted commands, the meter-monitor segments of each encrypted command includes an additional meter-monitor field:
.cndot. meter instructions.
In said examples, the meter-monitor format field information of said commands reflects the presence of said additional field.

As described above, said signals are of binary information with error correcting bit information and are embedded, transmitted, and received in the normal transmission pattern of the "Wall Street Week" television transmission.

All subscriber station apparatus are fully preprogrammed to perform automatically each step of each example. No manual step is required at any station.

In each example, the apparatus of FIG. 3 are preprogrammed to detect embedded signal information, to transfer said information to addressed apparatus, and to operate under control of said information. Apparatus of decoder, 203, are preprogrammed to detect signal information embedded in the normal transmission pattern and to correct, convert, and transfer ~~suppliers of the programing at remote sites. Working together,~~ said information to its addressed apparatus. Apparatus of signal processor, 200, are preprogrammed to decrypt information upon instruction and to transfer information to its addressed apparatus. For one or more remote services that meter and charge subscribers for the use of information or that audit such remote metering services, apparatus of signal processor, 200, are preprogrammed to select, process, and record meter information and to transfer recorded meter information to one or more remote station computers.

In each example, the EOFS valves located at controller, 39, of decoder, 203; at buffer/comparator, 8, of signal processor, 200; and at SPAM-controller, 205C, are preprogrammed to detect end of file signals that consist of eleven sequentially transmitted EOFS WORDs. Thus the binary information of eleven--"00001011"--is at the EOFS Standard Length Location of each of said EOFS valves.

In the third, fourth, and fifth examples, appropriate apparatus of FIG. 3 are also preprogrammed to assemble, record, and transmit to one or more remote locations monitor information for one or more services that sample selected subscriber stations (said stations being preprogrammed for this purpose) to collect statistical data on programming and information usage and/or to audit selectively the customer accounting of remote meter services.

In each example, receiving SPAM signal information at each apparatus of FIG. 3 causes subscriber station apparatus automatically to process said information in the preprogrammed fashions of said apparatus.

At the outset of each example, particular meter record information of prior programming exists at a particular location at buffer/comparator, 14, of signal processor, 200. Said record information documents the fact

that before receiving the "Wall Street Week" program, tuner, 215, transmitted to monitor, 202M, particular programming that contained embedded SPAM commands and information with particular meter instructions. Information of said commands and information caused buffer/comparator, 14, to retain said meter record information. In the third and subsequent examples, monitor record information of said prior programming also exists at a particular location at said buffer/comparator, 14, associated with the source mark of decoder, 203.

In each example, the recorder, 16, of signal processor, 200, has reached a level of fullness where the recording of the next signal record received from the buffer/comparator, 14, of signal processor, 200, will cause the quantity of signal records recorded at recorder, 16, to equal or exceed the particular fullness information of said recorder, 16. Whenever said quantity equals or exceeds said fullness information, recorder, 16, is preprogrammed to commences a particular telephone signal record transfer sequence that is fully automatic for which recorder, 16; controller, 20; auto dialer, 24; and telephone connection, 22, are each preprogrammed. Under control of the preprogrammed instructions of said sequence, signal processor, 200, telephones one or more remote billing station computers and/or one or more remote monitor information collection station computers and transfers selected record information to said computers.

In each example, all receiver station apparatus is on and fully operational.

Operating Signal Processor Systems--Example #1

The first example elaborates on the FIG. 1C combining described above in "One Combined Medium" and focuses on the operation of decoder, 203, SPAM-controller, 205C, and microcomputer, 205, on the execution of controlled functions, and on the use of cadence information to organize signal processing. The example begins as divider, 4, starts to transfer to decoder, 203, in its outputted composite video transmission, the embedded binary information of the first message. At the outset of example #1, controller, 39, of decoder, 203, and SPAM-controller, 205C, have each identified an end of file signal and await header information.

Receiving said embedded binary information at decoder, 203, (which does not include a filter, 31, or a demodulator, 32, because its input is a composite video transmission) causes line receiver, 33, automatically to detect and transfer said embedded information to digital detector, 34, which automatically detects the binary information with correcting information in said embedded information and transfers said binary information with correcting information to controller, 39. Using forward error correction techniques, well known in the art, and employing particular correcting information, controller, 39, automatically checks said information, as it is received, and corrects it as necessary then discards said particular correcting information retaining only the corrected information. Using conversion protocol techniques, well known in the art, controller, 39, then automatically converts said corrected information into binary information that receiver station apparatus can receive and process. In this fashion, the binary information of the first message--more precisely, the first combining synch command and its associated program instruction set and end of file signal--are received and converted at decoder, 203.

Once the information of any given point-to-multipoint SPAM transmission has been checked, corrected, and converted in the foregoing fashion, subscriber station apparatus communicate said information point-to-point using flow control and error correction techniques, well known in the art, that include handshaking and requesting retransmission. Thereafter, any given transmission of SPAM information, so corrected and converted, contains not only bits of communicated SPAM information but also so-called "parity bits" that convey error correcting information. At present, the conventional practice is for every ninth bit to be a parity bit that is used, in a fashion well known in the art, to check the correctness of the preceding eight bits, or "byte," of communicated data.

Frequently in this disclosure, specific quantities of bits and bit locations are cited. Said bits are often specified as being "sequential" and "in their order after conversion," and said bit locations are often "contiguous." Unless otherwise stated, said quantities refer only to bits of communicated SPAM information and bit locations that hold communicated SPAM information. No attempt is made to account for the presence of parity bits among transmitted bits of SPAM information or at particular memory locations because techniques for distinguishing bits of communicated data from parity bits and for processing bits of communicated information separately from parity bits are well known in the art.

Automatically, after said binary information is converted, said information is inputted to the EOFS valve of controller, 39, which processes said information in the fashion described above, comparing each signal word of said information to EOFS WORD information and transferring said binary information, signal word by signal word, until an end of file signal is detected.

Receiving the header and execution segment of said first message causes controller, 39, to determine that said message is addressed to URS microcomputers, 205, and to transfer said message to microcomputer, 205. So transferring said message is the controlled function that the information said header and execution segment cause controller, 39, to perform. Automatically, as said EOFS valve transfers converted binary information of said first message, controller, 39, selects and records at particular SPAM-header register memory a particular preprogrammed constant number of the first converted bits of said binary information. Said constant number is the number of bits in a SPAM command header. (Hereinafter, said constant number is called "H".) From the first bit of said binary information, H bits are selected and recorded, in their order after conversion, at said SPAM-header memory. Then, automatically, controller, 39, determines that said information at SPAM-header memory (which is the "01" header of the first combining synch command and designates a SPAM command that is followed by an information segment) does not match particular 11-header-invoking information that is "11". (In other words, the header of said message does not designate a SPAM message that consists of a header followed immediately by an information segment.) Not resulting in a match causes controller, 39, automatically to select a second preprogrammed constant number of next bits and record said bits, in their order after conversion, at particular SPAM-exec register memory. Said second constant number is the particular number of bits in a SPAM execution segment. (Hereinafter, said second constant number is called "X".) Beginning with the next bit of said binary

information immediately after said H bits, controller, 39, selects X bits and records said bits, in their order after conversion, at said SPAM-exec memory. Then, automatically, by comparing the information at said SPAM-exec memory (which information is the execution segment of the first combining synch command) with preprogrammed controlled-function-invoking information, controller, 39, determines that said information at memory matches particular this-message-addressed-to-205 information that causes controller, 39, to execute particular preprogrammed transfer-to-205 instructions. Said instructions cause controller, 39, to transfer to SPAM-controller, 205C, the SPAM message associated with the particular information at SPAM-header memory. Automatically, said instructions cause controller, 39, to activate the output port that outputs to SPAM-controller, 205C, then compare said information at SPAM-header memory to preprogrammed header-identification information. Automatically, controller, 39, determines that said information matches particular "01" information. Said match causes controller, 39, automatically to execute particular transfer-a-01-or-an-11-header-message instructions.

A "01" header distinguishes a message that contains lowest priority information. Any given instance of a message with a "01" header ends with an end of file signal. Accordingly, said instructions cause controller, 39, to transfer, from the start of said message, all information received from said valve until said valve detects and transfers the information of an end of file signal. Automatically controller, 39, commences transferring said binary information, starting with said first H bits and transferring said information in its order after conversion, signal word by signal word, as said binary information is outputted by said EOFS valve. In due course, the EOFS valve of controller, 39, receives the last signal word of the information segment of said first message. To satisfy the final rule of message composition cited above, said word, being an instance of a final signal word preceding an end of file signal, contains MOVE bit information and is not an EOFS WORD. Said valve transfers said word which causes controller, 39, to transfer said word to SPAM-controller, 205C. (When said valve receives information of the next signal word after said word, the information of the EOFS WORD Counter of said valve is "00000000" because said word contained MOVE bit information.)

Immediately after embedding and transmitting said last word, the aforementioned program originating studio that is the original transmission station of the programming of "One Combined Medium" generates and embeds an end of file signal in said programming and transmits said signal. More precisely, said studio generates, embeds, and transmits eleven consecutive EOFS WORDs of binary information.

Receiving said first EOFS WORD causes said valve to place information of said WORD at the EOFS Word Evaluation Location of said valve and to compare the information at said Location to the EOFS WORD at the EOFS Standard Word Location of said valve. A match results, causing said valve, in the fashion described above, to increase the value of the information at said EOFS WORD Counter by an increment of one from "00000000" to "00000001". Automatically said valve determines, in the fashion described above, that the "00000001" at said EOFS WORD Counter does not match the "00001011" at said EOFS Standard Length Location which causes said valve to cause the apparatus that inputs signal words to said valve to transfer to said valve the next signal word of said message.

In this fashion, said valve processes sequentially the inputted information of each of the next ten EOFS WORDs, each time increasing the value of the information at said EOFS WORD Counter by an increment of one. When, in the course of the word evaluation sequence of the eleventh and last EOFS WORD, said valve so increases said value, the information at said Counter is "00001011". Automatically said valve determines that said "00001011" matches the "00001011" at said EOFS Standard Length Location which causes said valve to execute the complete-signal-detected instructions described above in "Detecting End of File Signals." Said instructions cause said valve to initiate the transmission of the aforementioned EOFS-signal-detected information to the CPU of controller, 39, as an interrupt signal then to wait for a control instruction from controller, 39, before processing inputted information further.

Receiving said EOFS-signal-detected information at said CPU causes controller, 39, to determine, in a predetermined fashion, that said end of file signal is part of a SPAM message being transferred under control of instructions invoked by transfer-to-addressed-apparatus information. Said determining causes controller, 39, automatically to transmit the aforementioned transmit-and-wait instruction to said valve which causes said valve to transfer one complete end of file signal (which signal is automatically transferred by controller, 39, to SPAM-controller, 205C). Automatically, said valve outputs, sequentially, the binary information of eleven instances of an EOFS WORD; then sets the information at said EOFS WORD Counter to "00000000"; initiates transmission of the aforementioned complete-and-waiting information to the CPU of controller, 39, as an interrupt signal; and commences waiting for a control instruction from controller, 39, before processing next inputted information. In so doing, controller, 39, transfers an end of file signal as a part of said first message and ensures that apparatus to which said message is transferred receive all cadence information necessary to process said message.

Having transferred the binary information of said first message, controller, 39, prepares all apparatus of decoder, 203, as required, to receive the next instance of SPAM message information. Automatically, controller, 39, deactivates all output ports; compares the information at said SPAM-header register memory to particular preprogrammed

cause-retention-of-exec information that is "01" and determines a match which causes controller, 39, to transfer information of said information at SPAM-exec register memory to particular SPAM-last-01-header-exec register memory (thereby placing information of the execution segment of the first combining synch command at said SPAM-last-01-header-exec memory); then causes all apparatus of decoder, 203, to delete from memory all information of said binary information except information at said SPAM-last-01-header-exec memory. Then, after receiving said complete-and-waiting information, controller, 39, transmits particular reopen-flow instructions that cause said EOFS valve to recommence processing and transferring inputted signal words in its preprogrammed fashion, and controller, 39, commences waiting to receive from said valve the binary information of a subsequent SPAM header.

(If said information at SPAM-exec memory had failed to match any controlled-function-invoking information at the aforementioned comparing, said failure to match would have signified that the subscriber station of FIG. 3 did not have capacity to execute the controlled function of said

command. Whenever comparing execution segment information of any given command to preprogrammed controlled-function-invoking information at any given subscriber station SPAM apparatus results in a failure to match, said failure to match causes said apparatus to discard all received information of the message of said execution segment. In the case of a "01" header message such as said first message, said apparatus discards all received information, except information at register memory, until the EOFS valve of said apparatus, operating in the aforementioned fashion, transfers said EOFS-signal-detected information to the CPU of said apparatus. Said apparatus discards said information, in a fashion described more fully below, by placing each successively received signal word at a particular memory location, and in so doing, overwriting and obliterating the information of the prior signal word. Then receiving said EOFS-signal-detected information causes said apparatus to transmit the aforementioned discard-and-wait instruction to said valve causing said valve, in its preprogrammed discard-and-wait fashion, to discard all information of the end of file signal of said message, set the information of the EOFS WORD Counter of said valve to "00000000", then transmit said complete-and-waiting information to said apparatus. Said complete-and-waiting information causes said apparatus to perform all functions performed by controller, 39, in the foregoing paragraph.)

At SPAM-controller, 205C, of the subscriber station of FIG. 3 (and at SPAM-controllers, 205C, of URS microcomputers, 205, at other subscriber stations), receiving said transferred binary information of the first message causes all apparatus automatically to process the information of said message in the preprogrammed fashions of said apparatus.

Automatically the EOFS valve of SPAM-controller, 205C, commences processing and transferring said information until an end of file signal is detected.

Receiving the header and execution segment of said first message causes SPAM-controller, 205C, to determine the controlled function or functions that said message instructs URS microcomputers, 205, to perform and to execute the instructions of said functions. Automatically, as said valve transfers information, SPAM-controller, 205C, selects the first H converted bits of said information and records said bits at particular SPAM-header-@205 register memory, then determines that said information at SPAM-header-@205 memory (which is the "01" header of the first message) does not match particular 11-header-invoking-@205 information that is "11". Not resulting in a match causes controller, 39, automatically to select the next X bits of said transferred binary information and record said bits at particular SPAM-exec-@205 register memory. Automatically SPAM-controller, 205C, compares the information at said SPAM-exec-@205 memory (which information is the execution segment of the first combining synch command) with preprogrammed controlled-function-invoking-@205 information. Said comparing results in a match with particular execute-at-205 information that causes SPAM-controller, 205C, to invoke particular preprogrammed load-run-and-code instructions that control the loading of particular binary information at the main RAM of microcomputer, 205; the running of the information so loaded; and the placing of particular identification code information at particular SPAM-controller memory. Said binary information that is loaded and run is the information that begins at the first bit of the information segment that follows said X bits, continues through the last bit of said segment, and is, in the "One Combined

Medium" application, the information of said program instruction set. Automatically, SPAM-controller, 205C, executes said load-run and-code instructions.

(No change takes place between controller, 39, and SPAM-controller, 205C, in the information of the execution segment of the first combining synch command. Thus the binary image of the particular controlled-function-invoking information that said information matches at controller, 39--more precisely, the aforementioned particular this-message-addressed-to-205 information--is identical to the binary image of the particular controlled-function-invoking-@205 information that said information matches at SPAM-controller, 205C--said particular execute-at-205 information. While said this-message-addressed-to-205 information and said execute-at-205 information are identical in image, they bear different names in this specification because they invoke different controlled functions. This is but one of many instances in this specification where a given SPAM command invokes different controlled functions at different apparatus because the apparatus are preprogrammed differently.)

To load and run said information, SPAM-controller, 205C, must locate the position, in said transferred binary information, of said first bit and said last bit. Under control of said load-run-and-code instructions, SPAM-controller, 205C, compares the information at said SPAM-header-@205 memory with particular preprogrammed header-identification-@205 information and determines that said information at memory matches particular "01" information. In other words, to locate said first bit, SPAM-controller, 205C, must process the command information of an "01" header message including the length token of a meter-monitor segment.

Under control of said load-run-and-code instructions, said match causes SPAM-controller, 205C, automatically to execute particular preprogrammed process-length-token-@205 instructions. Automatically, said instructions cause SPAM-controller, 205C, to select a third preprogrammed constant number of next bits and record said bits at particular memory. Said third constant number is the particular number of bits in an instance of SPAM meter-monitor format field length token information. (Hereinafter, said third constant number is called "L".) Beginning with the bit of said transferred binary information immediately after the last of said X bits, SPAM-controller, 205C, selects L bits and records said bits, in their order after conversion, at particular SPAM-length-info-@205 register memory. Automatically SPAM-controller, 205C, compares the information at said SPAM-length-info-@205 memory with preprogrammed token-comparison-@205 information and determines that said information at memory matches particular token-comparison-@205 information (which particular information is called, hereinafter, "W-token information"). Said match causes SPAM-controller, 205C, to place particular preprogrammed bit-length-number information at said SPAM-length-info-@205 memory. (Said particular bit-length-number information is called, hereinafter, "w-bits information".) Said information is the precise number of bits, following the last of said L bits, that remain in the meter-monitor segment of the command associated with said length token. Said number is not a preprogrammed constant value such as H, X, and L that is the same for every SPAM command with a meter-monitor segment. Rather, said number is a variable that may differ from one SPAM meter-monitor segment to the next. More precisely, it is, for any given meter-monitor segment, a selected one of several preprogrammed bit-length-number information alternatives.

(Hereinafter, the number of the particular selected bit-length-number alternative associated with any given length token is called "MMS-L" to signify that said number is L bits less than the number bits in the meter-monitor segment in which said length token occurs.)

Having executed said process-length-token-@205 instructions and continuing under control of said load-run-and-code instructions, automatically SPAM-controller, 205C, adds L to the information (of MMS-L) at said SPAM-length-info-@205 memory and, in so doing, determines the exact number of bits in the meter-monitor segment of said command (which is also the exact number of bits from the first bit after the last of said X bits to the last bit of said command). (Hereinafter, the exact number of bits in any given meter-monitor segment is called, "MMS".) Then SPAM-controller, 205C, causes information of the first MMS bits of said transferred binary information that begin immediately after the last of said X bits to be stored at particular MMS-memory of SPAM-controller, 205C. In so doing, SPAM-controller, 205C, retains information of the meter-monitor segment of said first message. Then, automatically, SPAM-controller, 205C, executes particular preprogrammed instructions, including assess-padding-bit-@205 instructions, that are described more fully elsewhere in this specification and that cause said SPAM-controller, 205C, to identify the particular signal word, associated with the command information of said first message, that is the last signal word before the first signal word of the information segment of said message.

Then SPAM-controller, 205C, commences loading information at the main RAM of microcomputer, 205. Automatically, under control of said load-run-and-code instructions, SPAM-controller, 205C, instructs microcomputer, 205, to commence receiving information from SPAM-controller, 205C, and loading said information at particular main RAM, in a fashion well known in the art. Automatically SPAM-controller, 205C, commences transferring information to microcomputer, 205, beginning with said selected signal word. Automatically, as microcomputer, 205, receives said information, microcomputer, 205, loads said information at particular main RAM.

In due course, the EOFS valve of SPAM-controller, 205C, receives the aforementioned last signal word of the information segment of said first message, which is the last signal word of said program instruction set, and transfers said word which causes SPAM-controller, 205C, to transfer said word to microcomputer, 205, and microcomputer, 205, to load said word at said RAM. (After transferring said word, the information of the EOFS WORD Counter of said valve is "00000000".)

Then said valve commences receiving information of the eleven EOFS WORDs sequentially outputted by the EOFS valve of controller, 39, which information constitutes the end of file signal in said transferred binary information. Receiving the first EOFS WORD of said eleven causes the EOFS valve of SPAM-controller, 205C, to commence retaining information of said WORD in the fashion described above. Said retaining causes SPAM-controller, 205C, to stop transferring information to microcomputer, 205, and microcomputer, 205, to stop loading information at said RAM. As said valve receives all said EOFS WORD information, said valve detects said end of file signal just as the EOFS valve of controller, 39, detected the end of file signal in the binary information inputted to said valve. When, in the course of the word evaluation sequence of the

eleventh and last EOFS WORD in said information, the EOFS valve of SPAM-controller, 205C, determines that the information at the EOFS WORD Counter of said valve matches the information at the EOFS Standard Length Location of said valve, said valve initiates the transmission of the aforementioned EOFS-signal-detected information to the CPU of SPAM-controller, 205C, as an interrupt signal and commences waiting for a control instruction from said CPU.

Receiving said EOFS-signal-detected information at said CPU while under control of said load-run-and-code instructions causes SPAM-controller, 205C, to cease loading and execute the remainder of said load-run-and-code instructions. Automatically SPAM-controller, 205C, causes microcomputer, 205, to cease loading information at said RAM and execute the information so loaded as so-called "machine executable code" of one so-called "job." Because information of said end of file signal is no longer needed, said instructions cause SPAM-controller, 205C, to transmit the aforementioned discard-and-wait instruction to said valve. Said instruction causes said valve to set the information at said EOFS WORD Counter to "00000000" without transferring any information of said detected end of file signal; to initiate transmission of the aforementioned complete-and-waiting information to the CPU of SPAM-controller, 205C, as an interrupt signal; and to wait for a control instruction from SPAM-controller, 205C, before processing next inputted information.

Then SPAM-controller, 205C, commences executing the code portion of said load-run-and-code instructions. The instructions of said portion cause SPAM-controller, 205C, to compare the information at said SPAM-header memory to particular load-run-and-code-header information that is "01". A match results (which indicates that said first message contains meter-monitor information). Said match causes SPAM-controller, 205C, to execute particular preprogrammed evaluate-meter-monitor-format instructions and locate-program-unit instructions. Under control of said instructions and in a fashion that is described more fully below, SPAM-controller, 205C, locates the "program unit identification code" information in the information of the meter-monitor segment stored at said MMS-memory. Then said code portion instructions cause SPAM-controller, 205C, to place said code information at particular SPAM-first-precondition register memory. In so doing, SPAM-controller completes said load-run-and-code instructions and completes the controlled functions executed by the execution segment information of said first message.

Having completed said controlled functions, automatically SPAM-controller, 205C, prepares to receive the next instance of SPAM message information. Automatically, SPAM-controller, 205C, compares the information at said SPAM-header-@205 register memory to particular preprogrammed cause-retention-of-exec-@205 information that is "01" and determines a match which causes SPAM-controller, 205C, to transfer information of said information at SPAM-exec-@205 register memory to particular SPAM-last-01-header-exec-@205 register memory. Then SPAM-controller, 205C, causes all apparatus of SPAM-controller, 205C, to delete from memory all information of said transferred binary information except information at said SPAM-first-precondition and SPAM-last-01-header-exec-@205 memories. Finally, after receiving said complete-and-waiting information, SPAM-controller, 205C, transmits particular instructions that cause said EOFS valve to commence processing

and transferring inputted signal words, in its preprogrammed detecting fashion, and SPAM-controller, 205C, commences waiting to receive from said valve the binary information of a subsequent SPAM header.

As described in "One Combined Medium" above, loading and running said program instruction set causes microcomputer, 205, (and URS microcomputers, 205, at other subscriber stations) to place appropriate FIG. 1A image information at particular video RAM. In addition, running said set also causes microcomputer, 205, after completing placing said image information at said RAM, to transfer particular number-of-overlay-completed information and instructions to SPAM-controller, 205C. Said information and instructions cause SPAM-controller, 205C, to place the number "00000001" at particular SPAM-second-precondition register memory at SPAM-controller, 205C, signifying that said image information represents the first overlay of its associated video program.

(Had said information at SPAM-exec-@205 memory failed to match any execute-at-205 information at the aforementioned comparing, SPAM-controller, 205C, would have discarded discard all received information of the message of said information at SPAM-exec-@205 in the fashion described above.)

Operating S. P. Systems . . . Example #1 (Second Message)

Subsequently, the embedded information of the second message, which conveys the second combining synch command, is transferred from divider, 4, to decoder, 203.

In the same fashion that applied to the first message, receiving said embedded information causes the apparatus of decoder, 203, to detect, check, correct as necessary, and convert said information, into binary information of said second message. Automatically the EOFS valve of controller, 39, processes and transfers said information, signal word by signal word.

As with the first message, receiving the header and execution segment of said second message causes controller, 39, to determine that said message is addressed to URS microcomputers, 205, and to transfer said second message accordingly. Automatically, as said valve transfers said binary information, controller, 39, selects the first H converted bits and records said bits, in their order after conversion, at said SPAM-header register memory. Automatically controller, 39, determines that the information at said memory (which is the "00" header of the second combining synch command and signifies a SPAM command with a meter-monitor segment but no information segment) does not match said 11-header-invoking information that is "11". Not resulting in a match causes controller, 39, automatically to select the next X bits of said binary information immediately after said H bits, the execution segment of the second combining synch command, and record said X bits, in their order after conversion, at said SPAM-exec register memory. Then, automatically, by comparing the information at said SPAM-exec memory with said controlled-function-invoking information, controller, 39, determines that said information at memory matches particular preprogrammed this-message-addressed-to-205 information that invokes said transfer-to-205 instructions. Automatically, controller, 39, executes said instructions; activates the output port that outputs to

SPAM-controller, 205C; compares said information at SPAM-header memory to header-identification information; and determines that said information matches particular "00" information. (In other words, the header of said second message is "00".) Said match causes controller, 39, automatically to invoke particular preprogrammed transfer-a-00-header-message instructions.

A "00" header distinguishes a message that contains intermediate priority information but no lowest priority information. To identify the length and last bit of a "00" header message, controller, 39, must process length token information and may need to execute the aforementioned assess-padding-bit instructions to determine whether a full signal word of padding follows the last signal word in which command information occurs.

Automatically, said transfer-a-00-header-message instructions cause controller, 39, to execute particular preprogrammed process-length-token instructions. Said instructions cause controller, 39, to select the first L bits of said binary information immediately after the last of said X bits and record said selected bits, in their order after conversion, at particular SPAM-length-info register memory. Said L bits are the bits of the length token of said "00" header message. Automatically controller, 39, compares the information at said SPAM-length-info memory to preprogrammed token-comparison information and determines that said information at memory matches particular X-token information. (Said X-token information is different token-comparison information from the W-token information matched by the length-token of the first message of example #1.) Said match causes controller, 39, automatically to select particular preprogrammed x-bits information that is bit-length-number information associated on a one to one basis with said X-token information and to place said x-bits information at said SPAM-length-info memory. The numeric value of said x-bits information is the MMS-L, the precise number of bits, after the last of said L bits, that remain in the meter-monitor segment associated with said L bits.

Then said transfer-a-00-header-message instructions cause controller, 39, to execute particular preprogrammed determine-command-information-word-length instructions. Said instructions cause controller, 39, to add a particular preprogrammed constant number that is the sum of H plus X plus L to the x-bits information at said SPAM-length-info memory. (Hereinafter, said constant is called "H+X+L".) In so doing, controller, 39, determines the number of bits in the command information of said "00" header message. Then controller, 39, divides the numeric information at said memory by the number of bits in one signal word and stores the quotient of said dividing at said SPAM-length-info memory. By determining said quotient, controller, 39, determines the number of signal words in said command information. (Said quotient may be an integer or a so-called "floating point number" that is a whole number plus a decimal fraction.)

Having determined said number of signal words, controller, 39, can determine whether or not the possibility exists that an instance of the aforementioned full signal word of padding bits follows the last signal word of said number of signal words. If said command information fills a whole number of signal words plus a decimal fraction, the last signal word in which command information occurs is not completely filled by command information bits. Padding bits that are MOVE bits fill out said signal word, and no possibility exists that a full signal word of padding

bits follows said signal word. On the other hand, if said command information fills a whole number of signal words exactly, the last signal word in which command information occurs is completely filled by command information bits. The possibility exists that said signal word may contain no MOVE bit information and that a full signal word of padding bits may follow said signal word.

To determine whether said possibility exists, said transfer-a-00-header-message instructions cause controller, 39, to execute particular preprogrammed evaluate-end-condition instructions. In a fashion well known in the art, said instructions cause controller, 39, to identify the largest integer that is less than or equal to the information at said SPAM-length-info memory and place information of said integer at particular working register memory. Then controller, 39, compares the information at said working memory to the information at said SPAM-length-info memory. (For the information of said largest integer to equal the information of said quotient means that said quotient is an integer, that said command information fills a whole number of signal words exactly, and that the possibility exists that a full signal word of padding bits does follow the last signal word in which command information occurs.) If the information at said working memory is equal to the information at said SPAM-length-info memory, said instructions cause controller, 39, to place "0" information at particular SPAM-Flag-working register memory. Otherwise said instructions cause controller, 39, to place "1" information at said memory.

Then said transfer-a-00-header-message instructions cause controller, 39, to execute particular preprogrammed calculate-number-of-words-to-transfer instructions. Automatically, controller, 39, compares the information at said SPAM-Flag-working memory to particular end-condition-comparison information that is "0". (If the information at said SPAM-Flag-working memory is "0", said command information fills a whole number of signal words exactly; said whole number is the integer information at said working memory; but the last signal word of command information must be evaluated to ascertain whether it contains MOVE bit information.) Under control of said instructions, resulting in a match with said "0" information causes controller, 39, to subtract one (1) from the numeric value of the integer &0 information at said working memory. (On the other hand, if the information at said SPAM-Flag-working memory is "1", said command information only partially fills the last of a whole number of signal words exactly; MOVE bits fill the remainder of the last of said words; and said whole number is one greater than said largest integer information that is at said working memory.) Under control of said instructions, not resulting in a match with said "0" information causes controller, 39, to add one to the numeric value of the integer information at said working memory.

Next said transfer-a-00-header-message instructions cause controller, 39, to execute particular preprogrammed commence-transfer instructions. Said instructions cause controller, 39, to transfer a particular number of signal words of said command information, starting with the signal word in which the first of said first H bits occurs and transferring said information in its order after conversion, signal word by signal word. Said number is the numeric value of the integer information at said working memory.

Finally, said transfer-a-00-header-message instructions cause

controller, 39, to execute particular preprogrammed evaluate-padding-bits-? instructions that cause controller, 39, to compare the information at said SPAM-Flag-working memory to particular continue-? information that is "0".

Not resulting in a match means that, under control of said commence-transfer instructions, controller, 39, has transferred all command information of said "00" header message and no possibility exists that a full signal word of padding bits ends said message. Accordingly, not resulting in a match causes controller, 39, to complete said transfer-a-00-header-message instructions.

On the other hand, resulting in a match means that controller, 39, has transferred all but the last signal word of command information, and said word must be evaluated to ascertain whether it contains MOVE bit information. Accordingly, resulting in a match causes controller, 39, to execute the aforementioned assess-padding-bit instructions. Said instructions cause controller, 39, to compare said last word to particular preprogrammed end?-EOFS-WORD information that is the information of one EOFS WORD. If no match results, said word is the last word of said message. Otherwise, one full signal word of padding bits follows said word and ends said message. Accordingly, when said last word is compared to said EOFS WORD information, not resulting in a match causes controller, 39, to transfer just said last signal word, but resulting in a match causes controller, 39, to transfer said last signal word then the signal word, in said binary information, that is immediately after said signal word. In so doing, controller, 39, transfers the complete binary information of the message of the instance of header information at said SPAM-header memory and completes said transfer-a-00-header-message instructions.

Two specific cases illustrate the operation of said transfer-a-00-header-message instructions. One focuses on the "00" header message of FIG. 2H. The other,focuses on the message of FIG. 2K. In either case, the signal words are eight-bit bytes, H equals two, X equals six, L equals two, and H+X+L equals ten. In both cases, controller, 39, is preprogrammed with token-comparison information, including particular 01-token information that is "01" and is associated, on a one to one basis, with particular preprogrammed 01011-bits information that is the binary representation of eleven and particular 11-token information that is "11" and is associated, on a one to one basis, with particular preprogrammed 10110-bits information that is the binary representation of twenty-two. In both cases, when said instructions are invoked, information of the first H (that is, the first two) bits of the message being processed has been recorded at SPAM-header memory and information of the next X (that is the next six, the third through the eight bits) has been recorded at SPAM-exec memory. Thus said instructions process binary information that commences at the bit that is located immediately after the eighth bit of said message which eighth bit is the last of said X bits.

FIG. 2H shows one instance of a message that contains command information that fills a whole number of signal words plus a decimal fraction. Said command information fills two bytes plus five bits (that is, 2.625 bytes). Three padding bits that are MOVE bits have been added to the third byte of said message to fill out said byte.

When said transfer-a-00-header-message instructions are executed in the

course of the processing of the message of FIG. 2H, said instructions cause processing to proceed in the following fashion.

Said process-length-token instructions are executed and cause controller, 39, to select the first two bits of said binary information immediately after said eighth bit and record said bits at said SPAM-length-info memory. Said two bits are "01", the length-token of said message. (After said bits are recorded at said memory, the information at said memory is "0000000000000001".) Automatically controller, 39, commences comparing the information at said SPAM-length-info memory to said token-comparison information. In the course of said comparing, controller, 39, automatically places at 35 particular working register memory said 01-token information that is "01". (After said information is placed at said memory, the information at said memory is "0000000000000001".) Automatically, controller, 39, compares the information at said SPAM-length-info memory to the information at said working memory, and a match results. Said match causes controller, 39, automatically to select said 01011-bits information that is the binary representation of eleven and place said information at said SPAM-length-info memory. (Eleven, which is the numeric value of said 01011-bits information, is the MMS-L of said message.)

Then automatically said determine-command-information-word-length instructions are executed. Said instructions cause controller, 39, to add H+X+L, which is the binary representation of ten, to the information at said SPAM-length-info memory. In so doing, controller, 39, places at said SPAM-length-info memory the numeric value of the number of bits in the command information of said message--twenty-one (which is eleven plus ten). Then controller, 39, divides the numeric value information at said memory (twenty-one) by the number of bits in one byte (eight) and stores the quotient of said dividing (which quotient is 2.625 and is stored in a floating point fashion) at said SPAM-length-info memory. In so doing, controller, 39, determines that said command information occupies 2.625 bytes.

Next said evaluate-end-condition instructions are executed. Said instructions cause controller, 39, to identify the integer two (2) as the largest integer that is less than or equal to the 2.625 information that is at said SPAM-length-info memory and to place binary information of said integer, two (2), at said working register memory. Automatically controller, 39, compares said two (2) information at working memory to said 2.625 information at SPAM-length-info memory. Because the information at said working memory is not equal to the information at said SPAM-length-info memory, controller, 39, automatically places "1" information at said SPAM-Flag-working register memory.

Then said calculate-number-of-words-to-transfer instructions are executed. Automatically, controller, 39, compares the information at said SPAM-Flag-working memory to said end-condition-comparison information that is "0", and no match results. (The fact that the information at said SPAM-Flag-working memory is "1", means that said command information only partially fills the last byte of said message, that MOVE bits fill the remainder of said byte, and that the number of bytes in said message is one greater than said integer information at said working memory.) Not resulting in a match causes controller, 39, to add one (1) to the numeric value two (2) that is the information at said working memory, thereby increasing the numeric value of said information at working memory to

three (3).

Next said commence-transfer instructions are executed. Said instructions cause controller, 39, to transfer three (3) eight-bit bytes (which three (3) is the numeric value of the integer information at said working memory) of binary information, starting with the byte in which the first bit of said message occurs and transferring said information in its order after conversion, byte by byte. In so doing, controller, 39, transfers all information of said message to the addressed apparatus of said message.

Finally, said evaluate-padding-bits-? instructions are executed and cause controller, 39, to compare the "1" information at said SPAM-Flag-working memory to said continue-? information that is "0", and no match results. Not resulting in a match causes controller, 39, to complete said transfer-a-00-header-message instructions.

In this fashion, said transfer-a-00-header-message instructions cause controller, 39, to transfer the message of FIG. 2H to the addressed apparatus of said message.

By contrast, the second illustrative case of FIG. 2K shows a message that contains command information that fills a whole number of signal words exactly and is followed by a full signal word of padding bits. The command information of said message fills four bytes. The last of said bytes contains only EOFS bits and is an EOFS WORD. Accordingly said last byte is followed by one full byte of padding bits which one byte is the fifth and last byte of said message.

Said transfer-a-00-header-message instructions cause the message of FIG. 2K, to be processed in the following fashion.

Said process-length-token instructions cause controller, 39, to select the ninth and tenth bits of said binary information and record said bits at said SPAM-length-info memory. Said two bits are the "11" length-token of said message, and after said bits are so recorded, the information at said memory is "0000000000000011". Automatically controller, 39, commences comparing said information at SPAM-length-info memory to said token-comparison information. Automatically controller, 39, places said 11-token information that is "11" at said working register memory, after which the information at said memory is "0000000000000011". Automatically, controller, 39, compares said information at SPAM-length-info memory to said information at said working memory, and a match results. Said match causes controller, 39, automatically to select said 10110-bits information that is the binary representation of twenty-two and place said information at said SPAM-length-info memory. (Twenty-two, which is the decimal equivalent value of said 10110-bits information, is the MMS-L of said message.)

Then said determine-command-information-word-length instructions cause controller, 39, to add H+X+L, which is the binary representation of ten, to the information at said SPAM-length-info memory, making the information at said SPAM-length-info memory the binary representation of thirty-two. Then controller, 39, divides information at said memory (thirty-two) by the number of bits in one byte (eight) and stores the quotient of said dividing (which quotient is 4 and is stored in an integer fashion) at said SPAM-length-info memory. In so doing,

controller, 39, determines that said command information occupies 4 bytes exactly.

Next said evaluate-end-condition instructions cause controller, 39, to identify the integer four (4) as the largest integer that is less than or equal to the 4 information at said SPAM-length-info memory and to place binary information of said integer, four (4), at said working register memory. Automatically controller, 39, determines that said four (4) information at working memory matches said 4 information at SPAM-length-info memory. Said match causes controller, 39, automatically to place "0" information at said SPAM-Flag-working register memory.

Then said calculate-number-of-words-to-transfer instructions cause controller, 39, to determine that the information at said SPAM-Flag-working memory matches said end-condition-comparison information that is "0". Said match causes controller, 39, to subtract one (1) from the numeric value, four (4), that is the information at said working memory, thereby decreasing the numeric value of said information at working memory to three (3).

Next said commence-transfer instructions cause controller, 39, to transfer three (3) eight-bit bytes (which three (3) is the numeric value of the integer information at said working memory) of binary information, starting with the byte in which the first bit of said message occurs and transferring said information in its order after conversion, byte by byte. In so doing, controller, 39, transfers all but the last byte of command information. Controller, 39, transfers the first, second, and third bytes. But the fourth byte, which is said last byte, remains untransferred.

Finally, said evaluate-padding-bits-? instructions cause controller, 39, to determine that the "0" information at said SPAM-Flag-working memory matches said continue-? information that is "0". Resulting in a match causes controller, 39, to execute said assess-padding-bit instructions. Said instructions cause controller, 39, to compare said last byte to said end-? EOFS WORD information. Because the fourth byte of the message of FIG. 2K is an EOFS WORD, a match results. Said match means that a full byte of padding bits follows said last byte of command information. Said match causes controller, 39, to transfer two bytes of binary information which bytes are the fourth and fifth bytes of said message (which fifth byte is the last signal word of said message). Then said instructions cause controller, 39, to complete said transfer-a-00-header-message instructions.

In this fashion, said transfer-a-00-header-message instructions cause controller, 39, to transfer the message of FIG. 2K to the addressed apparatus of said message.

In applicable fashions of said transfer-a-00-header-message instructions, controller, 39, transfers to SPAM-controller, 205C, the complete binary information of the message that contains the second combining synch command.

When controller, 39, completes said transfer-a-00-header-message instructions, automatically controller, 39, prepares all apparatus of decoder, 203, to receive a next SPAM message. Controller, 39, deactivates all output ports; determines that the information at said SPAM-header

register memory does not match said cause-retention-of-exec information that is "11"; causes all apparatus of decoder, 203, to delete from memory all information of said binary information; then commences to wait for the binary information of a subsequent SPAM header.

At SPAM-controller, 205C, (and at the SPAM-controllers, 205C, of other URS microcomputers, 205), receiving the transferred binary information of said second message causes all apparatus automatically to process the information of said message in their preprogrammed fashions.

Automatically the EOFS valve of SPAM-controller, 205C, processes said information and transfers said information, signal word by signal word.

Receiving the header and execution segment of said second message causes SPAM-controller, 205C, to determine the controlled function or functions that said message instructs URS microcomputers, 205, to perform and to execute the instructions of said functions. Automatically, as said valve transfers information, SPAM-controller, 205C, selects the H first converted bits of said information, records said bits at said SPAM-header-@205 register memory, and determines that the information at said memory (which is the "00" header of said second message) does not match said 11-header-invoking-@205 information. No match results which causes controller, 39, automatically to select the next X bits of said transferred binary information and record said bits at particular SPAM-exec-@205 register memory. Automatically SPAM-controller, 205C, compares the information at said SPAM-exec-@205 memory with said controlled-function-invoking-@205 information. Said comparing results in a match with particular execute-conditional-overlay-at-205 information that causes SPAM-controller, 205C, to execute particular preprogrammed conditional-overlay-at-205 instructions.

Said instructions cause SPAM-controller, 205C, to execute "GRAPHICS ON" at the PC-MicroKey System of microcomputer, 205, if particular specified conditions are satisfied. To satisfy said conditions, the instance of image information at the video RAM of microcomputer, 205, (FIG. 1A) must be relevant to particular broadcast video programming transmitted immediately after the instance of broadcast programming in which said second message is embedded (FIG. 1B). More precisely, particular program unit and overlay number information specified for each instance must match. In the meter-monitor segment of the second combining synch command, said command conveys specified unit and number information for said instance of broadcast programming. If, in a fashion described below, said specified information matches particular other unit and number information, said conditional-overlay-at-205 instructions cause SPAM-controller, 205C, so to execute "GRAPHICS ON". Accordingly, said second command is one example of a specified condition command.

In order to determine whether said specified information matches said other information, SPAM-controller, 05C, must locate said specified information. More precisely, SPAM-controller, 205C, must locate two particular information fields of the meter-monitor segment of said second command. One is the program unit field whose information identifies uniquely the program unit of said "Wall Street Week" program. The other is the overlay number field whose information identifies uniquely the particular one of the overlays of said program that said command specifies and causes to be overlayed.

To locate said information, said conditional-overlay-at-205 instructions cause SPAM-controller, 205C, to execute the aforementioned evaluate-meter-monitor-format instructions. (Because said conditional-overlay-at-205 instructions are executed only by SPAM commands with "00" headers, comparing information at said SPAM-header-@205 memory with header-identification-@205 information is unnecessary.) Said evaluate-meter-monitor-format instructions cause SPAM-controller, 205C, to select particular bits at particular predetermined locations in said transferred binary information and record said bits at particular SPAM-format register memory. Said bits are the bits of the meter-monitor format field of said command. Then, automatically, by comparing the information at said SPAM-format memory with preprogrammed format-specification information, SPAM-controller, 205C, determines that said information at memory matches particular information that invokes particular process-this-specific-format instructions. Automatically SPAM-controller, 205C, executes said instructions, and said instructions cause one particular offset-address number to be placed at particular SPAM-mm-format-@205 register memory at SPAM-controller, 205C. Said number specifies the address/location at the RAM of SPAM-controller, 205C, of the first bit of information that identifies the specific format of the meter-monitor segment of said second command.

Then said conditional-overlay-at-205 instructions cause SPAM-controller, 205C, to execute the aforementioned locate-program-unit instructions. Making reference to the information at said SPAM-mm-format memory, said instructions cause SPAM-controller, 205C, to selects two particular preprogrammed binary numbers located at said RAM at two particular predetermined program-unit distances from said address/location and places said numbers, respectively, at the aforementioned first- and second-working register memories. Said numbers are respectively (1) the bit distance from the first bit of said transferred binary information to the first bit of said program unit field and (2) the bit length of said program field. Automatically SPAM-controller, 205C, selects particular information that begins at a bit distance after the first bit of said binary information, which bit distance is equal to the information at said first-working memory, and that is of a bit length equal to the information at said second-working memory. SPAM-controller, 205C, places said selected information at said first-working memory (thereby overwriting and obliterating the information previously there). In so doing, SPAM-controller, 205C, selects from the bits of said transferred binary information and records at said first-working memory the information of said program unit field.

Then said conditional-overlay-at-205 instructions cause SPAM-controller, 205C, to compare the information at said first-working memory, which is the unique "program unit identification code" that identifies the program unit of said "Wall Street Week" program, to the information at the aforementioned SPAM-first-precondition register memory, which is the same unique code (having been transmitted to SPAM-controller, 205C, in the program unit field of the meter-monitor segment of the first combining synch command and so selected and recorded at said register memory under control of said evaluate-meter-monitor-format instructions and said locate-program-unit instructions when said instructions were executed by said load-run-and-code instructions in the course of the processing of said first message). A match results (which indicates that SPAM-controller, 205C, executed said load-run-and-code instructions under

control of said first message.)

(At any subscriber station where information at first-working register memory fails to match information at SPAM-first-precondition register memory [indicating that the SPAM-controller, 205C, had not executed said instructions], said failing to match causes the SPAM-controller, 205C, of said station to execute particular preprogrammed instructions that cause the microcomputer, 205, of said station to clear all SPAM information from main and video RAMs and commence waiting for subsequent control instructions. Then the preprogrammed instructions of said SPAM-controller, 205C, cause SPAM-controller, 205C, to discard all information of transferred binary information of said second message and commence waiting for the binary information of a subsequent SPAM header.)

At the subscriber station of FIG. 3, said match of information at said first-working memory and information at SPAM-first-precondition memory, causes SPAM-controller, 205C, to continuing executing particular conditional-overlay-at-205 instructions. Said instructions cause SPAM-controller, 205C, to execute particular preprogrammed locate-overlay-number instructions. Making reference to the information at said SPAM-mm-format memory, said instructions cause SPAM-controller, 205C, to selects two particular preprogrammed binary numbers located at said RAM at particular predetermined overlay-number distances from said address/location and places said numbers, respectively, at said first- an second-working register memories. Said numbers are respectively (1) the bit distance from the first bit of said transferred binary information to the first bit of said overlay number field and (2) the bit length of said overlay field. Automatically SPAM-controller, 205C, selects particular information that begins at a bit distance after the first bit of said binary information, which bit distance is equal to the information at said first-working memory, and that is of a bit length equal to the information at said second-working memory. SPAM-controller, 205C, places said selected information at said first-working memory (thereby overwriting and obliterating the information previously there). In so doing, SPAM-controller, 205C, selects from the bits of said transferred binary information and records at said first-working memory the information of said overlay number field. (After the information of said overlay field is placed at said memory, the information at said memory is "00000001" .)

Then said conditional-overlay-at-205 instructions cause SPAM-controller, 205C, to compare the information at said first-working memory to the "00000001" information at the aforementioned SPAM-second-precondition register memory. A match results (indicating that microcomputer, 205, has completed placing appropriate FIG. 1A image at video RAM).

(At any subscriber station where information at first-working register memory fails to match information at SPAM-second-precondition memory [indicating that the microcomputer, 205, has failed to complete so placing information at video RAM], said failing to match causes the SPAM-controller, 205C, of said station to execute particular preprogrammed instructions that cause said SPAM-controller, 205C, to interrupt the operation of the CPU of said microcomputer, 205, in an interrupt fashion well known in the art, and transmit particular restore-efficiency instructions to said CPU that include information of the information at said first-working memory and that cause said microcomputer, 205, in a preprogrammed fashion discussed more fully

below, to restore efficient operation.)

At the subscriber station of FIG. 3 (and at URS microcomputers, 205, at other subscriber stations where information at first-working memory matches information at SPAM-second-precondition memory), said match causes SPAM-controller, 205C, to continue executing particular conditional-overlay-at-205 instructions at a particular instruction. Said instruction causes SPAM-controller, 205C, to execute "GRAPHICS ON" at said PC-MicroKey System. In so doing, SPAM-controller, 205C, completes said conditional-overlay-at-205 instructions and the controlled functions of the second combining synch command.

Having completed said controlled functions, automatically SPAM-controller, 205C, prepares to receive the next instance of SPAM message information. Automatically, SPAM-controller, 205C, determines that the information at said SPAM-header-@205 register memory does not match said cause-retention-of-exec information that is "01"; causes all apparatus of SPAM-controller, 205C, to delete from memory all information of said transferred binary information; and commences waiting to receive the binary information of a subsequent SPAM header.

In the foregoing fashion and as described in "One Combined Medium" above, said transferred information of the second combining synch command causes microcomputer, 205, to combine the programming of FIG. 1A and of FIG. 1B and transmit said combined programming to monitor, 202M, where FIG. 1C is displayed.

OPERATING S. P. SYSTEMS ... EXAMPLE #1 (THIRD MESSAGE)

Subsequently, the embedded information of the third message, which conveys the third combining synch command, is transferred from divider, 4, to decoder, 203.

In the same fashion that applied to the first and second messages, receiving said embedded information causes decoder, 203, automatically to detect, check, correct as necessary, convert said information into binary information of said third message; to process and transfer said binary information at the EOFS valve of controller, 39; and then to process the header and execution segment information in said binary information at controller, 39.

Receiving said header and execution segment information causes controller, 39, to determine that said message is addressed to URS microcomputers, 205, and to transfer said message accordingly. Receiving the first H converted bits of said binary information from said valve causes controller, 39, to select and record said H bits (the "10" header of the third combining synch command which designates a SPAM command with only an execution segment) at said SPAM-header register memory then determine that the information at said SPAM-header memory does not match said "11" information. Not resulting in a match causes controller, 39, to process the next X received bits as the execution segment of a SPAM command. Receiving the next X bits of said binary information from said valve causes controller, 39, to select and record said next X bits (the 0 execution segment of the third combining synch command) at said SPAM-exec register memory, compare the information at said SPAM-exec memory to said controlled-function-invoking information, determine that said information at memory matches particular preprogrammed this-message-addressed-to-205

information that invokes the aforementioned transfer-to-205 instructions, and execute said instructions. Automatically controller, 39, activates the output port that outputs to SPAM-controller, 205C; compares said information at SPAM-header memory to said header-identification information; and determines that said information at memory matches particular "10" information. Said match causes controller, 39, automatically to execute particular preprogrammed transfer-a-10-header-message instructions.

A "10" header distinguishes a message that is constituted only of first priority segments. At any given time, any given instance of "10" header message command information is of one constant binary length--the aforementioned header+exec constant length. (Hereinafter, said length is called "H+X" and is the sum of H plus X.) No length token information is processed, but it may be necessary to execute the aforementioned assess-padding-bit instructions to determine whether a full signal word of padding follows the last signal word in which command information occurs.

Said transfer-a-10-header-message instructions transfer a "10" header message by executing many of the preprogrammed instructions executed by the aforementioned transfer-a-00-header-message instructions that controlled the transferring of the "00" header second message of example #1.

Because length token information is not processed, said transfer-a-10-header-message instructions do not cause execution of said process-length-token instructions.

Because each instance of "10" header message command information is of said one constant binary length, H+X, said transfer-a-10-header-message instructions do not cause execution of said determine-command-information-word-length instructions. Instead, said transfer-a-10-header-message instructions include particular preprogrammed 10-header-word-length information that is described more fully below.

Just as with "00" header messages, the the possibility can exist that a full signal word of padding bits may follow the last signal word of command information of a "10" header message. If H+X bits of binary information fill a whole number of signal words plus a decimal fraction, the last signal word of command information of any given instance of a "10" header message is not completely filled by command information bits. Padding bits that are MOVE bits fill out said word, and no possibility exists that a full word of padding bits follows said word. But if H+X bits fill a whole number of signal words exactly, the last signal word of command information is completely filled by command information bits. Said word may contain no MOVE bit information, and a full signal word of padding bits may follow said word.

Because each instance of "10" header message command information is of said one length, said transfer-a-10-header-message instructions do not cause execution of said evaluate-end-condition instructions to determine whether said possibility exists. Instead, said transfer-a-10-header-message instructions include particular preprogrammed 10-header-end-condition information. At those times when H+X bits of binary information fill a whole number of signal words exactly, said information is the binary value of zero. At all other times, said

information is the binary value of one.

Likewise, because each instance of "10" header message command information is of said one length, said transfer-a-10-header-message instructions do not cause execution of said calculate-number-of-words-to-transfer instructions. Instead, at any given time said 10-header-word-length information is preprogrammed number information that applies to every instance of "10" header message information. At those times when H+X bits of binary information fill an integer number of signal words exactly and a full signal word of padding bits may follow the last signal word in which command information occurs, said 10-header-word-length information is, itself, and integer that equals said integer number minus one. In the preferred embodiment where signal words are eight-bit bytes said 10-header-word-length information equals (H+X / 8)-1. At those times when H+X bits of binary information do not fill a whole number of signal words exactly and the quotient of H+X divided by the number of bits in a signal word is a whole number plus a decimal fraction, said 10-header-word-length information equals the smallest integer larger than said quotient.

The first set of preprogrammed instructions that said transfer-a-10-header-message instructions and said transfer-a-00-header-message instructions have in common are said commence-transfer instructions. But before said transfer-a-10-header-message instructions can execute said commence-transfer instructions, said 10-header-word-length information and said 10-header-end-condition information must be at particular locations. Accordingly, when executed said transfer-a-10-header-message instructions cause controller, 39, to place information of said 10-header-word-length information at the aforementioned particular working register memory and information of said 10-header-end-condition information at the aforementioned SPAM-Flag-working register memory.

Next said transfer-a-10-header-message instructions cause controller, 39, to execute said commence-transfer instructions. Said instructions cause controller, 39, to transfer a particular number of signal words of said command information, starting with the signal word in which the first of said first H bits occurs and transferring said information in its order after conversion, signal word by signal word. Said number is the numeric value of the integer information at said working memory.

Finally, said transfer-a-10-header-message instructions cause controller, 39, to execute said evaluate-padding-bits-? instructions that cause controller, 39, to compare the information at said SPAM-Flag-working memory to said continue-? information that is "0".

Not resulting in a match means that the last signal word in which command information occurs contains at least one MOVE bit of padding and that said 10-header-word-length information is the length of every instance of a "10" header message. Accordingly, not resulting in a match causes controller, 39, to end execution of said transfer-a-10-header-message instructions.

On the other hand, resulting in a match means that controller, 39, has transferred all but the last signal word of command information, and said word must be evaluated to ascertain whether it contains MOVE bit information. Accordingly, resulting in a match causes controller, 39, to

execute said assess-padding-bit instructions. Said instructions cause controller, 39, to compare said last word to said end-?-EOFS-WORD information. If no match results, said word is the last word of said message. Otherwise, one full signal word of padding bits follows said word and ends said message. Accordingly, not resulting in a match causes controller, 39, to transfer just said last signal word, but resulting in a match causes controller, 39, to transfer said last signal word then the signal word, in said binary information, that is immediately after said signal word. In so doing, controller, 39, transfers the complete binary information of the message of the instance of header information at said SPAM-header memory and completes said transfer-a-10-header-message instructions.

The case of the "10" message of FIG. 2J illustrates the operation of said transfer-a-10-header-message instructions. As with the "00" messages of FIG. 2H and FIG. 2K, signal words are eight-bit bytes, H equals two, and X equals six. Hence, H+X equals eight. Accordingly, controller, 39, is preprogrammed with 10-header-word-length information that is integer information of (8 / 8)-1. More precisely, said 10-header-word-length information is integer information of zero. And because H+X bits of binary information fill a whole number of signal words exactly, controller, 39, is preprogrammed with 10-header-end-condition information that is the binary value of zero.

Like FIG. 2K, FIG. 2J shows a message that contains command information that fills a whole number of signal words exactly. The command information of said message fills one byte, and said byte is the last byte of said command information. As FIG. 2J shows, said last byte contains MOVE bit information. Accordingly said last byte is not followed by one full byte of padding bits. The one byte of said message is the last byte of said command information and the last byte of said message.

Said transfer-a-10-header-message instructions cause the message of FIG. 2J, to be processed in the following fashion.

Executing said instructions causes controller, 39, to place information of said 10-header-word-length information at said particular working register memory and information of said 10-header-end-condition information at said SPAM-Flag-working register memory. (After said 10-header-end-condition information is placed at said SPAM-Flag-working memory, the information at said memory may be "0" or "00000000".)

Next said commence-transfer instructions cause controller, 39, to transfer zero (0) eight-bit bytes (which zero (0) is the numeric value of the integer information at said working memory) of binary information. (In other words, controller, 39, transfers no information.) In so doing, controller, 39, transfers all but the last byte of command information. The one byte of said message, which is said last byte, remains untransferred.

Then said evaluate-padding-bits-? instructions cause controller, 39, to determine that the zero information at said SPAM-Flag-working memory matches said continue-? information that is "0". Resulting in a match causes controller, 39, to execute said assess-padding-bit instructions. Said instructions cause controller, 39, to compare said last byte to said end-?-EOFS-WORD information. Because the one byte of the message of FIG. 2J contains MOVE bit information, no match results. Not resulting in a

match means that said one byte is the last byte of said message. Automatically, not resulting in a match causes controller, 39, to transfer one byte of binary information which byte is said one byte. Then said instructions cause controller, 39, to complete said transfer-a-10-header-message instructions.

In this fashion, said transfer-a-10-header-message instructions cause controller, 39, to transfer the message of FIG. 2J to the addressed apparatus of said message.

In applicable fashions of said transfer-a-10-header-message instructions, controller, 39, transfers to SPAM-controller, 205C, the complete binary information of the message that contains the third combining synch command.

When controller, 39, completes said transfer-a-10-header-message instructions, automatically controller, 39, prepares all apparatus of decoder, 203, to receive a next SPAM message. Controller, 39, deactivates all output ports; determines that the information at said SPAM-header register memory does not match said cause-retention-of-exec information that is "01"; causes all apparatus of decoder, 203, to delete from memory all information of said binary information; then commences to wait for the binary information of a subsequent SPAM header.

At SPAM-controller, 205C, (and at the SPAM-controllers, 205C, at other URS microcomputers, 205), receiving the transferred binary information of said third message causes all apparatus automatically to process the information of said message in their preprogrammed fashions.

Automatically the EOFS valve of SPAM-controller, 205C, processes said information and transfers said information, signal word by signal word.

Receiving the header and execution segment of said third message causes SPAM-controller, 205C, to identify and execute the controlled function or functions that said message instructs URS microcomputers, 205, to perform. Receiving the first H converted bits of said transferred binary information from said valve causes SPAM-controller, 205C, to select and record said H bits at said SPAM-header-@205 register memory; determine that the information at said memory does not match said 11-header-invoking information; then process the next X received bits of said binary information as the execution segment of a SPAM command. Receiving said next X bits causes SPAM-controller, 205C, to select and record said X bits at said SPAM-exec-@205 register memory; compare the information at said memory with said controlled-function-invoking-@205 information; determine that said information at memory matches particular cease-overlay information that causes SPAM-controller, 205C, to execute particular preprogrammed cease-overlaying-at-205 instructions; and execute said instructions.

Said instructions cause SPAM-controller, 205C, to execute "GRAPHICS OFF" at said PC-MicroKey System then transmit a particular clear-and-continue instruction to the CPU of microcomputer, 205, the function of which instruction is described more fully below. In so doing, SPAM-controller, 205C, completes said cease-overlaying-at-205 instructions.

(Because said cease-overlaying-at-205 instructions are executed only by SPAM commands with "10" headers, comparing information at said

SPAM-header-@205 memory with header-identification-@205 information is unnecessary.)

Having completed the controlled functions of said second message, automatically SPAM-controller, 205C, prepares to receive the next instance of SPAM message information. Automatically, SPAM-controller, 205C, determines that the information at said SPAM-header-@205 register memory does not match said cause-retention-of-exec-@205 information that is "01"; causes all apparatus of SPAM-controller, 205C, to delete from memory all information of said transferred binary information; and commences waiting to receive the binary information of a subsequent SPAM header.

In the foregoing fashion and as described in "One Combined Medium" above, said transferred information of the third combining synch command causes microcomputer, 205, to cease combining the programming of FIG. 1A and of FIG. 1B and commence transmitting to monitor, 202M, only the composite video programming received from divider, 4, (which causes monitor, 202M, to commence displaying only said video programming) and to continue processing in a predetermined fashion (which fashion may be determined by the aforementioned program instruction set).

Operating S. P. Systems . . . Example #1 (A Fourth Message)

The "One Combined Medium" example does not include an instance of a SPAM message with a "11" header, but decoder, 203, is preprogrammed to process such messages.

A fourth message of example #1 illustrates the processing of a "11" header message.

Immediately after transmitting the third message of example #1, the program originating studio of the "Wall Street Week" program embeds and transmits a fourth message. Said message consists of an "11" header followed immediately by an information segment containing a second program instruction set. More precisely, the first two bits of the first signal word of said message are said "11" header, and the remaining bits of said signal word are padding bits. The first signal word of said information segment is the signal word immediately after said first word. And immediately after the last signal word of said segment, an end of file signal is transmitted that ends said message.

Subsequently, the embedded information of said fourth message is transferred from divider, 4, to decoder, 203.

Receiving the embedded information of said message causes decoder, 203, automatically to detect, check, correct as necessary, and convert said information into binary information of said fourth message; to process and transfer said binary information at the EOFS valve of controller, 39; then to process the header in said binary information.

Receiving said header causes controller, 39, to determine that said message is addressed to URS microcomputers, 205, and to transfer said message accordingly. Receiving the first H converted bits of said binary information from said valve causes controller, 39, to select and record said H bits (said "11" header) at said SPAM-header register memory then determine that the information at said SPAM-header memory matches said

11-header-invoking information that is "11". Said match causes controller, 39, to execute particular preprogrammed process-11-header-message instructions.

Said instructions cause controller, 39, to execute controlled functions as if the information at said SPAM-last-01-header-exec register memory were the execution segment information of said "11" header message. Automatically, said instructions cause controller, 39, to compare the information at said SPAM-last-01-header-exec memory (which information is the execution segment of the first combining synch command) with said controlled-function-invoking information. Automatically, controller, 39, determines that said information at memory matches particular preprogrammed this-message-addressed-to-205 information that invokes the aforementioned transfer-to-205 instructions. Automatically controller, 39, executes said instructions; activates the output port that outputs to SPAM-controller, 205C; and determines that said information at SPAM-header memory matches particular "11" information. Said match causes controller, 39, automatically to execute said transfer-a-01-or-a-11-header-message instructions.

An "11" header distinguishes a message that contains lowest priority information. Just like an "01" header message, each instance of a message with a "11" header ends with an end of file signal. Accordingly, said instructions cause controller, 39, to transfer said fourth message in precisely the same fashion that applied to the transfer of the first message of example #1. Automatically controller, 39, commences transferring the binary information of said fourth message, starting with said first H bits, and continues so transferring, as said binary information is outputted by said EOFS valve, until said valve detects the end of file signal of said message and causes EOFS-signal-detected information to be inputted to the CPU of controller, 39.

In due course and in precisely the fashion of the first message of example #1, said valve detects the eleven EOFS WORDs of said end of file signal and causes transmission of said EOFS-signal-detected information to controller, 39, which causes controller, 39, to transmit said transmit-and-wait instruction to said valve. Said instruction causes said valve to perform all the functions caused by the corresponding instruction of said first message, including transferring one complete end of file signal (which information is automatically transferred to SPAM-controller, 205C). In this fashion, controller, 39, transfers the complete information of said fourth message to the addressed apparatus of said message--the SPAM-controller, 205C.

Having transferred the binary information of said fourth message, controller, 39, prepares all apparatus of decoder, 203, to receive the next instance of SPAM message information in precisely the fashion of said first message with one exception. Unlike said first message which had an "01" header and contained a command with an execution segment, said fourth message has an "11" header and contains no execution segment information. Accordingly, receiving said fourth message does not cause controller, 39, to record information at said SPAM-last-01-header-exec memory. When controller, 39, compares the information at said SPAM-header register memory to said cause-retention-of-exec information that is "01", no match results. The information that was at said memory when said message was received--specifically, the execution segment of the first message--remains at said memory.

(If no information were to exist at said SPAM-last-01-header-exec memory when information at said memory is compared with said controlled-function-invoking information, controller, 39, would detect the absence of said information in a predetermined fashion and, in the fashion described above in the description of the first message, would cause all apparatus of decoder, 203, to discard all message information until an end of file signal were received and discarded then would process the first H converted bits of the next received binary information as a subsequent SPAM header.)

At SPAM-controller, 205C, (and at SPAM-controllers, 205C, of URS microcomputers, 205) receiving the transferred binary information of said fourth message causes all apparatus automatically to process the information of said message in the preprogrammed fashions of said apparatus.

Automatically the EOFS valve of SPAM-controller, 205C, processes and transfers said information until an end of file signal is detected.

Receiving the header of said fourth message causes SPAM-controller, 205C, to determine the controlled function or functions that said message instructs URS microcomputers, 205, to perform and to execute the instructions of said functions. Receiving the first H bits of said transferred binary information from said valve causes SPAM-controller, 205C, to select and record said first H bits (said "11" header) at said SPAM-header-@205 register memory then determine that said information at SPAM-header-@205 memory matches said 11-header-invoking-@205 information that is "11". Said match causes SPAM-controller, 205C, to execute particular preprogrammed process-11-header-message-@205 instructions.

Said instructions cause SPAM-controller, 205C, to execute controlled functions as if the information at said SPAM-last-01-header-exec-@205 register memory (which information is the execution segment of the first combining synch command) were the execution segment information of said "11" header message. Automatically, said instructions cause SPAM-controller, 205C, to compare the information at said memory with said controlled-function-invoking information-@205. A match results with said execute-load-run-and-code information, causing SPAM-controller, 205C, automatically to execute said load-run-and-code instructions. As with said first message, said instructions control the loading, at the main RAM of microcomputer, 205, and running of the information segment information that follows said H bits, which information is said second program instruction set.

To locate, in said transferred binary information, the first bit of said information, said instructions cause SPAM-controller, 205C, to compare the information at said SPAM-header-@205 memory with said header-identification-@205 information and determine that said information at memory matches particular "11" information. In other words, to locate said bit, SPAM-controller, 205C, must process only the information associated with an "11" header. Accordingly, said match causes SPAM-controller, 205C, automatically to execute particular preprogrammed prepare-to-load-11-header-message instructions.

At any given time, each instance of header information is of one constant binary length--H bits--that either does or does not fill a whole

number of signal words exactly. If H bits do not, the last signal word of any given instance of a "11" header message header is not completely filled with header information, and padding bits that are MOVE bits fill out said signal word. But if H bits do fill a whole number of signal words exactly, the last signal word in which header information may contain no MOVE bit information, in which case one full word of padding bits follows said signal word and precedes the first information segment signal word of said message.

To locate said first bit, said prepare-to-load-11-header-message instructions include particular preprogrammed 11-header-word-length information and particular preprogrammed 11-header-end-condition information. At those times when H bits of binary information fill a whole number of signal words exactly, said 11-header-word-length information is the largest integer that is less than said whole number, and said end-condition information is the binary value of zero. At those times when H bits do not fill a whole number of signal words exactly, said 11-header-word-length information is the smallest integer larger than the number of signal words that said H bits do fill, and said header-end-condition information is the binary value of one.

When executed, said prepare-to-load-11-header-message instructions cause SPAM-controller, 205C, to place information of said 11-header-word-length at particular first-working-@205 register memory then compare said 11-header-end-condition information to particular preprogrammed information that is "0".

Not resulting in a match means that the last signal word in which header information occurs contains at least one MOVE bit of padding and that said 11-header-word-length information is the length of every instance of a "11" header information. Accordingly, not resulting in a match causes SPAM-controller, 205C, to execute of particular preprogrammed commence-loading-11-header-message instructions.

On the other hand, resulting in a match means that the last signal word of header information must be evaluated to ascertain whether it contains MOVE bit information. Accordingly, resulting in a match causes SPAM-controller, 205C, starting with the first signal word of said transferred binary information, to skip a number of signal words of said information, which number is the number of the integer information at said first-working-@205 memory. In so doing, SPAM-controller, 205C, skips every signal word of header information but said last word. Then, automatically, said instructions cause SPAM-controller, 205C, to compare said last word to said particular preprogrammed EOFS-WORD information. If no match results, said word is the last word of said message. Otherwise, one full signal word of padding bits follows said word and ends said message. Accordingly, not resulting in a match causes SPAM-controller, 205C, to add binary information of one to said integer information at said first-working-@205 memory, but resulting in a match causes SPAM-controller, 205C, to add binary information of two to said integer information at said first-working-@205 memory. Then, automatically, SPAM-controller, 205C, executes said commence-loading-11-header-message instructions.

When executed, said commence-loading-11-header-message instructions cause SPAM-controller, 205C, starting with the first signal word of said transferred binary information, to skip a number of signal words, which

number is the number of the integer information at said first-working-@205 memory. In so doing, SPAM-controller, 205C, skips every signal word of header information. Then said instructions instruct SPAM-controller, 205C, to commence loading information at the main RAM of microcomputer, 205, starting with the first signal word after the last skipped signal word, and cause SPAM-controller, 205C, to commence executing said load-run-and-code instructions at a particular instruction.

Starting at said instruction, said load-run-and-code instructions cause SPAM-controller, 205C, to instruct microcomputer, 205, to commence receiving information from SPAM-controller, 205C, and loading said information at particular main RAM, in a fashion well known in the art.

Thereafter, said instructions cause SPAM-controller, 205C, to process said fourth message in precisely the same fashion that applied to the first message of example #1.

Said load-run-and-code instructions cause SPAM-controller, 205C, to commence transferring information to microcomputer, 205, beginning with said first signal word, and transfér the remaining signal words of said transferred binary information, signal word by signal word, until said valve detects the end of file signal of said message and causes EOFS-signal-detected information to be inputted to the CPU of SPAM-controller, 205C. As microcomputer, 205, receives said information, it loads said information at particular main RAM.

In due course, said valve transfers the last signal word of the information segment of said fourth message, which is the last signal word of said program instruction set, which causes SPAM-controller, 205C, to transfer said word to microcomputer, 205, and microcomputer, 205, to load said word at said RAM.

In this fashion, receiving the information of said fourth message causes the apparatus of the subscriber station of FIG. 3 to load said program instruction set at the main RAM of microcomputer, 205, (and other stations to load said set at other main RAMs).

Then, in precisely the fashion of the first message of example #1, said valve detects the eleven EOFS WORDs of said end of file signal and causes transmission of said EOFS-signal-detected information to SPAM-controller, 205C which causes SPAM-controller, 205C, to cause microcomputer, 205, to cease loading information at said RAM and execute the information so loaded as the machine executable code of one job. Continuing in said fashion, SPAM-controller, 205C, transmits said discard-and-wait instruction to said valve which causes said valve to set the information at said EOFS WORD Counter to "00000000" and to process no next inputted information until a control instruction is received from SPAM-controller, 205C.

Then the code portion of said load-run-and-code instructions cause SPAM-controller, 205C, to operate in a fashion that differs from the fashion of said first message. The instructions of said portion cause SPAM-controller, 205C, to compare the information at said SPAM-header memory to said load-run-and-code information that is "01". No match results because the header of said fourth message is "11" (which means that said message contains no meter-monitor information). Not resulting

in a match causes SPAM-controller, 205C, automatically to skip the remaining instructions of said code portion and complete said load-run-and-code instructions without placing any program unit field information at said SPAM-first-precondition register memory. Accordingly, the program unit information of said "Wall Street Week" program that was caused to be placed at said SPAM-first-precondition memory by the first combining synch command remains at said memory.

Having processed the binary information of said fourth message, SPAM-controller, 205C, prepares all apparatus of decoder, 203, to receive the next instance of SPAM message information in precisely the fashion of said first message with one exception. Receiving said fourth message does not cause SPAM-controller, 205C, to record information at said SPAM-last-01-header-exec memory-@205. When SPAM-controller, 205C, compares the information at said SPAM-header-@205 memory to said cause-retention-of-exec-@205 information that is "01", no match results. The information that was at said memory when said message was received--specifically, the execution segment of the first message--remains at said memory.

In this fashion, the subscriber station of FIG. 3 processes a message with an "11" header.

OPERATING SIGNAL PROCESSOR SYSTEMS . . . EXAMPLE #2

In example #2, the first and third messages of the "Wall Street Week" combining are transmitted just as in example #1, but the second message is partially encrypted.

The second message conveys the second combining synch command. In example #2, before said message is embedded at the program originating studio and transmitted, the execution segment of said command and all of the meter-monitor segment except for the length-token are encrypted, using stahdard encryption techniques, well known in the art, that encrypt binary information without altering the number of bits in said information. Partially encrypting the second message in this fashion leaves the cadence information of said message unencrypted. In other words, the "00" header, the length-token, and any padding bits added at the end of said message remain unencrypted. Said message is only partially encrypted in order to enable subscriber stations that lack capacity to decrypt said message to process the cadence information of said message accurately.

In example #2, the encryption of said execution segment is done in such a fashion that, after encryption, said segment is identical to a particular execution segment that addresses URS signal processors, 200, and instructs said processors, 200, to use a particular decryption key J and decrypt the message in which said segment occurs.

Because said message is encrypted, its meter-monitor segment contains a sixth field, a meter instruction field. Accordingly, the length of the second message, the number of bits in its meter-monitor segment and the numeric value of MMS-L is greater in example #2 than in example #1.

As described above in "One Combined Medium," before any messages of the "Wall Street Week" programming are transmitted, control invoking instructions are embedded at said program originating studio and

transmitted to all subscriber stations. Among said instructions are particular ones that command URS microcomputers, 205, to set their PC-MicroKey Model 1300 Systems to the "Graphics Off" mode. Thus, at the outset of example #2, all PC-MicroKey 1300s are in the "Graphics Off" mode, and no microcomputer, 205, is transmitting combined information of video RAM and received composite video to its associated monitor, 202M. As will be seen, this fact has particular relevance in example #2.

In example #2, the first message of the "Wall Street Week" program is transmitted precisely as in the example #1 and causes precisely the same activity at subscriber stations. At each station, a microcomputer, 205, enters appropriate FIG. 1A image information at particular video RAM.

When decoder, 203, receives the embedded information of the second message of example #2, decoder, 203, processes and transfers said information in the same fashion that applied to the second message of example #1 with three exceptions.

First, controller, 39, determines that the second message of example #2 is addressed to URS signal processors, 200, rather than URS microcomputers, 205, and transfers the binary information of said message accordingly. When controller, 39, compares the information at SPAM-exec memory, which is the encrypted execution segment information of the second message of example #2, with controlled-function-invoking information, said information at memory does not match the this-message-addressed-to-205 information matched in example #1. Rather said information at memory matches particular preprogrammed this-message-addressed-to-200 information that invokes preprogrammed transfer-to-200 instructions. Controller, 39, executes said instructions, and rather than activating the output port that outputs to SPAM-controller, 205C, said instructions cause controller, 39, to activate the output port that outputs to buffer/comparator, 8, of signal processor, 200.

Then, subsequently, when said process-length-token instructions cause controller, 39, to compare the information at SPAM-length-info memory, which is the length-token information of said second message of example #2, to token-comparison information, said information at memory does not match the X-token information matched by the length-token of the second message of example #1. Rather, said information at memory matches particular preprogrammed Y-token information associated with particular preprogrammed y-bits information whose numeric value is the MMS-L of the second message of example #2. Said match causes controller, 39, automatically to select said y-bits information and place said information at said SPAM-length-info memory. Thus controller, 39, processes a value of MMS-L that is different from the value processed in example #1.

Finally, because the second message of example #2 is longer than the second message of example #1 and the MMS-L of example #2 is greater than the MMS-L of example #1, when said transfer-a-00-header-message instructions control the transfer of the second message of example #2 to signal processor, 200, said instructions transfer a longer message.

In all other respects, controller, 39 processes and transfers the second message of example #2 just as it processed and transferred the second message of example #1. And when the transfer of the second message of

example #2 is complete, controller, 39, automatically deactivates all output ports, deletes all received information of said message from memory, and commences waiting for the binary information of a subsequent SPAM header.

Receiving the binary signal information of said second message causes buffer/comparator, 8, automatically to execute a decryption sequence at signal processor, 200, that is fully automatic and for which all apparatus are preprogrammed.

Receiving said information causes buffer/comparator, 8, first, to place said information at a particular received signal location at buffer/comparator, 8, then to compare a particular portion the first X bits immediately after the first H bits of said binary information (which X bits are the executions segment of said message) to particular preprogrammed comparison information in its automatic comparing fashion. (Buffer/comparator, 8, is preprogrammed with information that identifies said portion.) A match results with particular comparison information that is the bit image of particular SPAM execution segment information that instructs URS signal processors, 200, to decrypt. Said match causes buffer/comparator, 8, to transfer to controller, 20, particular decrypt-this-message information that includes the memory position of the first bit location of said particular received signal location and information of the header and execution segment in said binary signal information. Receiving said information causes controller, 20, to compare the information of said execution segment to particular preprogrammed controlled-function-invoking-@200 information and determine a match with particular decrypt-with-key-J information that instructs controller, 20, to decrypt the received binary signal information with decryption key J.

(At subscriber stations whose URS signal processors, 200, are not preprogrammed with information of said key J, the information of said execution segment fails to match any controlled-function-invoking-@200 information. Said failures to match cause the controllers, 20, of said stations automatically to discard all information transferred by the buffer/comparators, 8; to cause said buffer/comparators, 8, to discard all received information of said second message; and to cause said controllers, 20, and said buffer/comparators, 8, to commence processing in the conventional fashion.)

(It is to facilitate SPAM processing at said stations that are not preprogrammed with necessary decryption key information that the cadence information of an otherwise encrypted SPAM message must remain unencrypted. Were either the header or length-token or any padding bits of said second message encrypted, the decoders, 203, and signal processors, 200, of said stations could process the information of the execution segment correctly but would be unable to locate the last bit of said second message and the header of the following message. Effective SPAM processing would cease and not resume until the apparatus at said stations detected an unencrypted end of file signal. Until that time, converted binary information could continue to invoke processing at said stations but said processing would be haphazard and almost certainly undesirable.)

Because the subscriber station of FIG. 3 is preprogrammed with all information needed to decrypt said second message, the aforementioned match with said decrypt-with-key-J information causes controller, 20, to

execute particular preprogrammed decrypt-with-J instructions. Among said preprogrammed instructions is key information of J, and said instructions cause controller, 20, automatically to select and transfer said key information to decryptor, 10.

Decryptor, 10, receives said key information and automatically commences using it as its key for decryption.

Then said decrypt-with-J instructions cause controller, 20, to activate the output capacity of buffer/comparator, 8, that outputs to decryptor, 10; to compare said information of the header transferred from buffer/comparator, 8, to particular preprogrammed header-identification-@200 information; and to determine that said information of the header matches particular "00" header information. Said match causes controller, 20, automatically to invoke particular preprogrammed decrypt-a-00-header-message instructions.

Controller, 20, is preprogrammed with information of H, X, L, and H+X; with process-length-token, determine-command-information-word-length, evaluate-end-condition, calculate-number-of-words-to-transfer, evaluate-padding-bits-? instructions; and with token-comparison, W-token, X-token, Y-token, w-bits, x-bits, and y-bits information. Using preprogrammed information and instructions as required, said decrypt-a-00-header-message instructions transfer the received binary information of said second message from buffer/comparator, 8, to decryptor, 10, in the same fashion that the aforementioned transfer-a-00-header-message instructions controlled the transfer of the information of said message from controller, 39, to buffer/comparator, 8.

Under control of said decrypt-a-00-header-message instructions, said process-length-token instructions cause controller, 20, to select the L bits of said binary signal information that begin at the first bit location that is H+X bit locations following the memory position of the first bit location of said particular received signal location at buffer/comparator, 8. Said L bits are the length token of said second message. Automatically controller, 20, compares the information of said L bits to token-comparison information and determines a match with preprogrammed Y-token information. Said match causes controller, 20, automatically to select y-bits information and process said information as the numeric value of MMS-L. Next said determine-command-information-word-length instructions cause controller, 20, to determine the number of signal words in the command information of said second message by adding H+X+L to said y-bits information of MMS-L and dividing the resulting sum by the number of bits in one signal word. Then said evaluate-end-condition instructions cause controller, 20, to place a "0" at particular SPAM-Flag-@20 register memory if said command information fills a whole number of signal words exactly and "1" at said memory if it does not. And said calculate-number-of-words-to-transfer instructions cause controller, 20, to determine a particular number of signal words to transfer and place information of said number at particular working-@20 register memory.

Then said decrypt-a-00-header-message instructions cause controller, 20, to transmit to controller, 12, a particular transfer-decrypted-message instruction and particular decryption mark information of key J that identifies J as the decryption key.

Receiving said instruction and information causes controller, 12, to execute particular preprogrammed transfer-and-meter instructions then record said mark of key J at particular decryption-mark-@12 register memory.

Next said decrypt-a-00-header-message instructions cause controller, 20, to cause buffer/comparator, 8, to transfer to decryptor, 10, a quantity of signal words of said binary information of the second message which quantity is the number at said working-@20 register memory.

Buffer/comparator, 8, responds by transferring to decryptor, 10, binary information that begins at the first bit at said particular received signal location and transfers said information, signal word by signal word, until it has transferred said quantity of signal words.

Decryptor, 10, commences receiving said information, decrypting it using said key J information and transferring it to controller, 12, as quickly as controller, 12, accepts it. The process of decryption proceeds in a particular fashion. Said decrypt-a-00-header-message instructions cause controller, 20, to cause decryptor, 10, to transfer the first H bits without decrypting or altering said bits in any fashion, to decrypt and transfer the next X bits, to transfer the next L bits without decrypting or altering said bits, to decrypt and transfer the next MMS-L bits, and finally, to transfer any bits remaining after the last of said MMS-L bits without decrypting or altering said bits. In this fashion, the cadence information in said message, which is not encrypted, is transferred by decryptor, 10, to controller, 12, without alteration.

Under control of said transfer-and-meter instructions, controller, 12, commences receiving decrypted information of the second message from decryptor, 10. Having been decrypted, said information is identical to the binary information of the second message of example #1 (except that the meter-monitor information contains the aforementioned meter instruction information that is not in example #1 and the length token information of the meter-monitor format field reflects the presence of said instruction information).

Automatically controller, 12, processes said information of the second message of example #2 as a SPAM command. Receiving the header and execution segment causes controller, 12, to determine that said message is addressed to URS microcomputers, 205, and to transfer said message accordingly. Automatically, controller, 12, selects the first H converted bits and records said bits at particular SPAM-header-@12 register memory then selects the next X bits and records said bits at particular SPAM-exec-@12 register memory. Then, automatically, by comparing the information at said SPAM-exec memory with preprogrammed controlled-function-invoking-@12 information, controller, 12, determines that said information at memory matches preprogrammed transfer-this-message-to-205-@12 information. Automatically, controller, 12, executes preprogrammed transfer-to-205-@12 instructions; activates the output port that outputs to SPAM-controller, 205C; then commences transferring information of said decrypted information of the second message under control of said transfer-and-meter instructions commencing with the first of said H bits and transferring information, signal word by signal word, in the order in which it is received from decryptor, 10. In addition, controller, 12, is preprogrammed with all instructions and information necessary for processing the length-token and determining the

length of the meter-monitor segment of said second message, does so, and records at particular SPAM-meter register memory the first L plus MMS-L bits of said decrypted information immediately after the last of said X bits which is the information of the meter-monitor segment of said message.

When buffer/comparator, 8, completes transferring to decryptor, 10, the quantity of signal words that is the number at said working-@20 register memory, said decrypt-a-00-header-message instructions cause controller, 20, to execute said evaluate-padding-bits-? instructions, determine which signal word is the last word of the second message of example #2, and ensure that said word is transferred to decryptor, 10. Following the transfer of said word, controller, 20, causes decryptor, 10, to transmit particular decryption-complete information to controller, 20, when decryptor, 10, completes the transfer to controller, 12, of said word following its decryption.

Receiving said word at controller, 12, causes controller, 12, to transfer said word to SPAM-controller, 205C, and in so doing, complete the transfer of the decrypted information of said second message.

At microcomputer, 205, (and at the URS microcomputers, 205, at other stations where the second message of example #2 is decrypted) in the fashion described in example #1, said information, which is the unencrypted binary information of the second combining synch command, executes "GRAPHICS ON" causing microcomputer, 205, to combine the programming of FIG. 1A and of FIG. 1B and transmit said combined programming to monitor, 202M, where FIG. 1C is displayed.

(Meanwhile, no second combining synch command reaches the URS microcomputers, 205, at those subscriber stations whose URS signal processors, 200, are not preprogrammed with information of decryption key J because all received information of the second message of example #2 has been discarded. No combining occurs at said microcomputers, 205. And at the time when FIG. 1C is displayed at subscriber stations preprogrammed with said key J, the monitors, 202M, of said subscriber stations display FIG. 1B.)

Then receiving said decryption-complete information from decryptor, 10, causes controller, 20, to cause buffer/comparator, 8, to discard any information of said second message that may remain at buffer/comparator, 8, and commence processing in the conventional fashion; to cause decryptor, 10, to discard said key information of decryption key J and any information of said second message that may remain at decryptor, 10; to transmit to controller, 12, a preprogrammed complete-transfer-phase instruction; and, itself, to commence processing in the conventional fashion.

Receiving said complete-transfer-phase instruction causes controller, 12, to cease transferring information, under control of said transfer-and-meter instructions, to deactivate all output ports, and to commence executing the meter instructions of said transfer-and-meter instructions. Said meter instructions cause controller, 12, to compare the information at said SPAM-header-@12 memory with particular collect-meter-info information and determine that said H bits match particular "00" information. (In other words, said SPAM command information contains meter-monitor information.) Said match causes

controller, 12, automatically to transfer to buffer/comparator, 14, particular header identification information that identifies controller, 12, as the source of said transfer the information recorded at said SPAM-meter memory then the information recorded at said decryption-mark-@12 register memory, which information is the decryption mark of key J. (Hereinafter, said meter information generated by the second combining synch command in example #2 is called the "2nd meter information (#2).") Following said transferring, controller, 12, automatically deletes from register memory all information of said second message and commences processing in the conventional fashion.

Receiving the 2nd meter information (#2) causes buffer/comparator, 14, automatically to execute a meter sequence that is fully automatic and for which all apparatus are preprogrammed and have capacity to perform.

Receiving said information causes buffer/comparator, 14, to compare a particular portion of the meter-monitor format field of said 2nd meter information (#2) to particular distinguishing comparison information that identifies meter-monitor format fields that denote the presence of meter instruction fields. A match results which causes buffer/comparator, 14, to select information of bits at particular predetermined locations (which bits contain the information of the meter instruction field of said 2nd meter information (#2)) and compare said selected information to preprogrammed metering-instruction-comparison information and to determine that said field matches particular increment-by-one information that instructs buffer/comparator, 14, to add one incrementally to each meter record maintained at buffer/comparator, 14, that is associated with decryption key information that matches the decryption mark of the instance of meter information being processed. Accordingly, buffer/comparator, 14, compares the decryption mark of said 2nd meter information (#2) with preprogrammed decryption-key-comparison information. Said comparing results in more than one match, and buffer/comparator, 14, increments by one the meter record associated with each particular decryption-key-comparison datum that matches the decryption mark of said 2nd meter information (#2). Because the information of said meter instruction field instructs signal processor, 200, only to perform said incrementing, upon completing the last step of incrementing or comparing, automatically buffer/comparator, 14, discards all information of said 2nd meter information (#2) except the incremented record information and commences processing in the conventional fashion.

Thus, not only does the second message of example #2 cause the combining of FIG. 1A and FIG. 1B and the display of FIG. 1C only at selected subscriber stations that are preprogrammed with decryption key J, it also causes the retaining of meter information associated with its own decryption at said selected stations.

Subsequently, decoder, 203, receives the third message of the "Wall Street Week" program which conveys the third combining synch command.

In example #2, all signal processing apparatus process the third combining synch command precisely as in the first example. Said command reaches all URS microcomputers, 205, and causes each to execute the aforementioned "GRAPHICS OFF" command. But only at those selected ones of said URS microcomputers, 205, that are preprogrammed with decryption key J does the third combining synch command actually cause combining to cease. At all other URS microcomputers, 205, executing "GRAPHICS OFF" has

no effect because each of said other URS microcomputers, 205, is already in "Graphics Off" mode when said "GRAPHICS OFF" is executed. Because the aforementioned particular ones among said control invoking instructions that preceded the first message of the "Wall Street Week" program caused all URS microcomputers, 205, to set their PC-MicroKey 1300s to the "Graphics Off" mode and because no information of the second combining synch command reached said other microcomputers, 205, and executed "GRAPHICS ON", the PC-MicroKey 1300 of each of said other URS microcomputers, 205, is in "Graphics Off" mode when the third message of example # 2 is transmitted.

Thus in example #2, not only does the second combining synch command cause the combining and the display of FIG. 1C only at selected subscriber stations and the retaining of meter information at (and only at) said stations, it also causes selective processing--for example, the selecting of information of decryption key J at selected stations--that enables the third combining synch command to have effect only at selected stations without any selective processing of said third command. Placing particular so-called "soft switches," one of which exists at each subscriber station, all into one given original position, "off" or "on", then transmitting a command that is processed selectively at selected stations and places said switches at said stations into the opposite position, "on" of "off", makes it possible to transmit a subsequent command that returns said switches at said selected stations (and only said switches) to said original position without any additional selective processing.

Significant advantages of simplicity and speed are achieved by devising signal processing apparatus and methods that minimize the need for selective processing. With regard to said third combining synch command, for example, no step of decrypting is required to affect only those stations that are preprogrammed with decryption key J. Accordingly, no possibility exists that an error in decrypting may occur at one or more of said stations, causing the combining of video RAM information and received video information, at said one or more, not to cease at the proper time and to continue beyond said time (until such time as some subsequent command may execute "GRAPHICS OFF" or clear information from said video RAM at said stations). Because no time is required for decrypting, no possibility exists that some station may take longer (or shorter) than proper to perform decrypting causing the image of FIG. 1A to be displayed at some monitor, 202M, longer (or shorter) than proper. Perhaps most important, because no time is required for selective processing of said third command, the time interval that separates the time of embedding said third command at said remote station that originates the "Wall Street Week" program and the time of ceasing caused by said command at URS microcomputers, 205, can be the shortest possible interval. Making it possible for said time interval to be the shortest possible interval minimizes the chance that an error may occur in the timing of the embedding of said third command at said remote station causing all URS microcomputers, 205, to cease combining at a time that is other than the proper time.

The Preferred Configuration or Controller, 39, And SPAM-Controller, 205 C

Heretofore, this specification has treated the controller of decoder, 203, (which is controller, 39) and the SPAM input controller of microcomputer, 205, (which is SPAM-controller, 205C) as separate

controllers. This treatment has served to show how SPAM messages are transferred from one controller to another, at any given subscriber station.

But, in the preferred embodiment, the controller of the decoder that detects the SPAM signals of a combined medium transmission, at any given subscriber station, and the controller that executes the information of said signals at the microcomputer that combines the local and broadcast programming, at said station, are one and the same. More precisely, controller, 39, of decoder, 203, and SPAM-controller, 205C, are one and the same (and are called, hereinafter, "controller, 39"). Thus the preferred embodiment of controller, 39, is configured and preprogrammed not only to control the detecting, correcting, converting, and executing of controlled functions at decoder, 203, but also to input to and execute at microcomputer, 205, the information of any given detected SPAM message that is addressed to URS microcomputers, 205.

FIG. 3A shows one such preferred controller, 39.

One aspect of the preferred embodiment of controller, 39, is a series of buffers and processors at which forward error correction, protocol conversion, and the invoking of controlled functions take place in series. Buffer, 39A, and processor, 39B, are the first buffer and processor of the series and perform the forward error correcting functions of controller, 39. Buffer, 39C, and processor, 39D, are the second buffer and processor and perform protocol conversion functions. Buffer, 39E, and control processor, 39J, are the third buffer and processor. All controlled functions invoked at controller, 39, by received SPAM signals are invoked at control processor, 39J.

Performing forward error correction and protocol conversion and invoking the controlled functions at a series of processors, in this fashion, rather than sequentially at one processor has significant advantages as regards speed. Inputting the information of each SPAM signal word to three processors does take longer than inputting said information to just one processor. But this is more than offset by the fact that having three processors rather than just one enables controller, 39, to process the information of three signal words simultaneously. Control processor, 39J, can invoke and process the controlled function of a first signal word while processor, 39D, converts the information of a second signal word and processor, 39B, corrects the information of a third signal word.

A second aspect of the preferred embodiment of controller, 39, is a matrix switch, 39I, that operates under control of control processor, 39J, and can transfer information of received SPAM signals from buffer, 39E, directly to addressed apparatus. Transferring said information in this fashion rather than through control processor, 39J, has the advantage of freeing control processor, 39J, to perform other functions while said information is transferred.

As FIG. 3A shows, each processor, 39B, 39D, and 39J, has associated RAM and ROM and, hence, constitutes a programmable controller in its own right. Each processor, 39B, 39D, and 39J, controls its associated buffer, 39A, 39C, and 39E respectively. Each buffer, 39A, 39C, and 39E, is a conventional buffer that receives, buffers, and transfers binary information in fashions well known in the art. Each buffer, 39A and 39C, transfers its received and buffered information to its associated

processor, 39B and 39D respectively, for processing. Buffer, 39E, transfers its received and buffered information, via EOFS Valve, 39F, to to matrix switch, 39I.

The preferred embodiment of controller, 39, also has a buffer, 39G, that is a conventional buffer with means for receiving information from other inputs external to decoder, 203. Among said inputs is, in particular, an input from controller, 12, of signal processor, 200 (which input performs the functions of the input from controller, 12, to SPAM-controller, 205C, shown in FIG. 3). Buffer, 39G, outputs its received and buffered information, via EOFS Valve, 39H, to matrix switch, 39I. Buffer, 39G, is configured, in a fashion well known in the art, with capacity to identify to control processor, 39J, which input is the source of any given instance of information received and buffered at buffer, 39G, and capacity to output selectively, under control of control processor, 39J, any given instance of received information.

EOFS Valves, 39F and 39H, are EOFS valves of the type described above and transfer the buffered information of buffers, 39E and 39G respectively, to matrix switch, 39I. Said valves operate under control of control processor, 39J, and monitor all information, so transferred, continuously for end of file signals in the fashion described above.

Matrix switch, 39I, is a conventional digital matrix switch, well known in the art of telephone communication switching, that is configured for the small number of inputs 35 and outputs required at controller, 39. Matrix switch, 39I, operates under control of control processor, 39J, and has capacity to receive SPAM signal information from a multiplicity of inputs, including EOFS Valves, 39E and 39F, and from control processor, 39J, and to transfer said information to a multiplicity of outputs, including control processor, 39J; the CPU of microcomputer, 205; buffer/comparator, 8, of signal processor, 200; buffer/comparator, 14, of signal processor, 200; and other outputs. Among such other outputs is one or more (hereinafter called, "null outputs") with capacity for accepting binary information and merely recording said information at particular memory associated with matrix switch, 39I, thereby overwriting and obliterating information previously recorded at said memory. The purpose of such a null output is to provide means whereby said switch can automatically cause information of any selected SPAM message to be discarded rather than transferred to addressed apparatus. (Other examples of other outputs are cited below.) Matrix switch, 39I, also has capacity to receive control information from control processor, 39J, and transfer said information to the CPU and/or the PC-MicroKey 1300 system of microcomputer, 205, and to receive control information from the CPU and/or the PC-MicroKey 1300 system of microcomputer, 205, and transfer said information to control processor, 39J. Matrix switch, 39I, transfers information in such a way that information inputted at any given input is transferred to a selected one or ones of said outputs without modification, and a multiplicity of information transfers can take place simultaneously. Control processor, 39J, has capacity for computing information and processing all control information necessary for controlling all apparatus of decoder, 203 (or such other decoder as the controller of a given control processor, 39J, may be installed in). In keeping with the function of control processor, 39J, as the processor at which all controlled functions of controller, 39, are invoked, all aforementioned particular register memories of controller, 39, are located at control processor, 39J. The register memories of control

processor, 39J, include (but are not limited to) particular SPAM-input-signal register memory whose length in bit locations is sufficient to contain the longest possible instance of SPAM command information with associated padding bits; the aforementioned SPAM-header and SPAM-exec register memories; particular SPAM-Flag-monitor-info, SPAM-Flag-at-secondary-control-level, SPAM-Flag-executing-secondary-command, SPAM-Flag-secondary-level-incomplete, SPAM-Flag-primary-level-2nd-step-incomplete, SPAM-Flag-primary-level-3rd-step-incomplete, SPAM-Flag-secondary-level-2nd-step-incomplete, SPAM-Flag-secondary-level-3rd-step-incomplete, SPAM-Flag-first-condition-failed, SPAM-Flag-second-condition-failed, SPAM-Flag-do-not-meter, and SPAM-Flag-working register memories each of which are one bit location in length; the aforementioned SPAM-length-info, SPAM-mm-format, SPAM-first-precondition, SPAM-second-precondition, SPAM-last-01-header-exec register memories; particular SPAM-decryption-mark, SPAM-primary-input-source, SPAM-secondary-input-source, SPAM-next-primary-instruction-address, SPAM-next-secondary-instruction-address, SPAM-executing-secondary-command, SPAM-last-secondary-01-header-exec, SPAM-address-of-next-instruction-upon-primary-interrupt, and SPAM-address-of-next-instruction-upon-secondary-interrupt register memories whose functions are described below; and a plurality of working register memories that include first-working and second-working register memories. (With the exception of the memories whose names include the word "working," all the aforementioned register memories are dedicated strictly to the functions described below and are not used for any other functions.) All preprogrammed information associated with the identification and execution of controlled functions and the aforementioned conventional instructions that control controller, 39, are preprogrammed at the RAM and/or ROM associated with control processor, 39J. Examples of said preprogrammed information include relevant information of the aforementioned controlled-function-invoking information, process-length-token instructions, and execute-conditional-overlay-at-205 information (that is part of the aforementioned controlled-function-invoking-@205 information).

Besides being the processor at which all controlled functions of controller, 39, are invoked, control processor, 39J, is the processor that controls all controlled apparatus of decoder, 203, (except for a decryptor, 39K, described more fully below) and controls all apparatus described above as being controlled by SPAM-controller, 205C. Control processor, 39J, controls not only buffers, 39E and 39G, valves, 39F and 39H, and switch, 39I, but also processors, 39B and 39D, as well as all other apparatus of decoder, 203, controlled by controller, 39. Control processor, 39J, has all required transmission capacity for transmitting control instructions to and receiving control information from all such controlled apparatus. In addition, control processor, 39J, controls the CPU and the PC-MicroKey 1300 system of microcomputer, 205, in certain SPAM functions and has capacity, via matrix switch, 39I, to transmit control information to and receive control information from said CPU and said PC-MicroKey 1300 system. In certain SPAM functions, controller, 20, of signal processor, 200, controls control processor, 39J, and as FIG. 3A shows, control processor, 39J, has means for communicating control information directly with said controller, 20. The RAM and/or ROM associated with control processor, 39J, are preprogrammed with all information necessary for controlling all such controlled apparatus.

As FIG. 3A shows, the preferred embodiment of controller, 39, also has a

decryptor, 39K. Said decryptor, 39K, is a conventional decryptor that is identical to decryptor, 10, of signal processor, 200. Decryptor, 39K, receives inputted information from matrix switch, 39I; outputs its information to buffer, 39H; has means for communicating control information directly with controller, 20, of signal processor, 200; and is controlled by said controller, 20. Decryptor, 39K, is preprogrammed with relevant SPAM information (e.g., information of H, X, and L) and has capacity for processing SPAM message information if fashions described more fully below.

In the preferred embodiment, to maximize the speed of information transmission, all apparatus of controller, 39, are located physically on one so-called silicon microchip and communicate with one another, in fashions well known in the art, by means of the circuits of said chip. All apparatus of said chip function, in a fashion well known in the art, at the same clock speed. Said speed may be the speed of the control clock of microcomputer, 205, communicated to controller, 39, in an appropriate fashion, well known in the art. Or said speed may be the control clock speed of signal processor, 200.

Examples #3 and #4 of the combining of the "Wall Street Week" program described above, which relate elaborations of examples #1 and #2, illustrate in detail the operation of the preferred embodiment of controller, 39.

Operating S. P. Systems . . . Example #3 (First Word)

Example #3 differs from example #1 in just two respects.

First, example #3 focuses on selected subscriber stations where signal processing apparatus and methods are used to collect monitor information for so-called "program ratings" (such as so-called "Nielsen ratings") that estimate the sizes of television (or radio) program audiences. In the present invention, subscriber stations can be preprogrammed to process and record monitor information of SPAM commands and transfer said information to one or more remote data collection stations where computers process the monitor information to generate such ratings. In example #3, all apparatus of the subscriber station of FIG. 3 are so preprogrammed, and buffer/comparator, 14, of signal processor, 200, operates, in fashions described more fully below, under control of the aforementioned on-board controller, 14A.

Second, the controller, 39, of example #3 is the preferred embodiment of controller, 39, and replaces the controller, 39, and SPAM-controller, 205C, of example #1. Insofar as messages addressed to URS microcomputers, 205, are concerned, the preferred embodiment of controller, 39, is preprogrammed to perform the controlled functions of the SPAM-controller, 205C, of example #1. Thus the preprogrammed information at the RAM and/or ROM associated with control processor, 39J, includes, for example, the execute-at-205, execute-conditional-overlay-at-205, and cease-overlay information and the load-run-and-code, conditional-overlay-at-205, and cease-overlaying-at-205 instructions preprogrammed at SPAM-controller, 205C, in example #1.

In all other respects example #3 is identical to example #1.

Example #3 begins, like example #1, with divider, 4, transferring the

embedded information of the first message to decoder, 203. In the same fashion that applied in example #1, receiving said embedded information at decoder, 203, causes the binary information of said first message to be received, with error correcting information, at decoder, 203, and detected at digital detector, 34. Detector, 34, inputs the detected information to controller, 39, at buffer, 39A.

The first step of processing at controller, 39, takes place at processor, 39B, where error correction occurs. As said detected information is inputted, buffer, 39A, receives, buffers, and transfers said information, signal word by signal word, an to processor, 39B, in a fashion well in the art. Processor, 39B, receives each word, in turn, with its associated error correcting information and uses the error correcting information, in its forward error correcting fashion, to check the binary information of said word and correct the information of said word, as required, then transfers the correct information of said word to buffer, 39C, and discards said error correcting information.

The second step of processing is protocol conversion and takes place at processor, 39D. Buffer, 39C, receives and buffers the corrected information of each word, in turn, and transfers said information to processor, 39D. As processor, 39D, receives said information, in its protocol conversion fashion, processor, 39B, converts the corrected binary information of each word into converted information that all appropriate subscriber station apparatus can receive and process and transfers the converted information of each word to buffer, 39E.

As buffer, 39E, receives the corrected information of each word, buffer, 39E, buffers and transfers said information to EOFS valve, 39F, as quickly as said valve, 39F, is prepared to receive said information. EOFS valve, 39F, processes said information, in its end of file signal detecting fashion described above, to detect information of an end of file signal and outputs said information to matrix switch, 39I, as quickly as the apparatus to which said switch, 39I, transfers said information is prepared to receive said information. As matrix switch, 39I, receives the converted information of each word, said switch, 39I, transfers said information to a selected output port of said switch, 39I. Said selected port is the particular port to which control processor, 39J, causes said switch, 39I, to transfer said information.

At the outset of example #3, matrix switch, 39I, is configured to input the output of EOFS Valve, 39F, to control processor, 39J, and control processor, 39J, awaits header information.

When EOFS valve, 39F, commences transferring the SPAM information of the first message of example #3, control processor, 39J, executes a first step of receiving SPAM message information and receives the header information in said first message. Control processor, 39J, accepts, receives in turn, and records in sequence at particular SPAM-input-signal register memory a particular first quantity of said words. Said first quantity is the smallest number of signal words that can contain one instance of header information (that is, H bits). In the simplest preferred embodiment where a SPAM header is two bits long and signal words are eight-bit bytes, said first quantity is one. Then, automatically, control processor, 39J, ceases accepting SPAM signal information transferred from EOFS valve, 39F, and said valve, 39F, commences holding the next processed signal word of said first message

until control processor, 39J, becomes prepared, once again, to accept and receive SPAM signal information.

Then control processor, 39J, processes said header information. Automatically, control processor, 39J, selects information of the first H bits at said SPAM-input-signal memory and records said information of H bits at said SPAM-header memory then compares the information at said SPAM-header memory to the aforementioned 11-header-invoking information that is "11". No match results.

Because control processor, 39J, and the RAM and ROM associated with said processor, 39J, are preprogrammed to process the monitor information of SPAM commands to provide viewership data for remote computer processing, not resulting in a match with said 11-header-invoking information causes control processor, 39J, to execute particular preprogrammed evaluate-message-content instructions before receiving and processing the execution segment information in said first message. Automatically, said instructions cause control processor, 39J, to compare the information at said SPAM-header memory with preprogrammed invoke-monitor-processing information. A match results with particular "01" information. Said match signifies the presence of meter-monitor information in said first message and causes control processor, 39J, to enter "0" at particular SPAM-Flag-monitor-info register memory that is normally "1".

Then automatically control processor, 39J, executes a second step of receiving SPAM signal information and receives the execution segment information in said first message. Automatically, control processor, 39J, commences accepting and EOFS valve, 39F, commences transferring additional SPAM signal words. Automatically, control processor, 39J, receives and records said words in sequence at said SPAM-input-signal memory immediately following the last of said first quantity of signal words until the total quantity of SPAM signal words recorded at said memory equals a particular second quantity. Said second quantity is the smallest number of signal words that can contain one instance of header and execution segment information (that is, H+X bits). (If H+X bits can be contained in one signal word, said second quantity equals said first quantity, and control processor, 39J, records no additional SPAM signal words in the course of said second step of receiving SPAM signal information.) Automatically, control processor, 39J, ceases accepting SPAM signal information transferred from EOFS valve, 39F.

Then control processor, 39J, processes said execution segment information. Automatically, control processor, 39J, selects information of the first X bits of information at said SPAM-input-signal memory immediately after the first H bits, records said information of X bits at said SPAM-exec memory, and compares the information at said SPAM-exec memory with controlled-function-invoking information that is preprogrammed at the RAM and/or ROM associated with said processor, 39J. A match results with the aforementioned execute-at-205 information that is identical to the execute-at-205 information preprogrammed at SPAM-controller, 205C, of example #1: Said match causes control processor, 39J, to execute the aforementioned load-run-and-code instructions. Said instructions cause control processor, 39J, to place "0" at the aforementioned SPAM-Flag-primary-level-2nd-step incomplete register memory and, separately, at SPAM-Flag-primary-level-3rd-step-incomplete register memory, which information signifies that specific load-run-and-code controlled functions have not been completed, and to

place information of a particular reentry-address at the aforementioned SPAM-address-of-next-instruction-upon-primary-interrupt register memory which reentry-address specifies the location of the next decrypt-process-and-meter-current-message instruction to be executed when interrupt information of a detected end of file signal is received by control processor, 39J, from EOFS valve, 39F. Then said instructions cause control processor, 39J, to compare the information at said SPAM-header memory with preprogrammed header-identification information and determine a match with particular preprogrammed "01" information.

Under control of said instructions, said match causes control processor, 39J, automatically to execute a third step of receiving SPAM signal information and receive the length token information in said first message. Automatically, control processor, 39J, commences accepting and EOFS valve, 39F, commences transferring additional SPAM signal words. Automatically, control processor, 39J, receives and records said words in sequence at said SPAM-input-signal memory immediately following the last of said second quantity of signal words until the total quantity of SPAM signal words recorded at said memory equals a particular third quantity. Said third quantity is the smallest number of signal words that can contain one instance of header, execution segment, and length token information (that is, H+X+L bits). Then, automatically, control processor, 39J, ceases accepting SPAM signal information transferred from EOFS valve, 39F.

Automatically, control processor, 39J, processes said length token information. The RAM and ROM associated with control processor, 39J, are preprogrammed with all information necessary to determine the length of SPAM commands including information of H, X, L, and H+X; process-length-token, determine-command-information-word-length, evaluate-end-condition, calculate-number-of-words-to-transfer, evaluate-padding-bits-? instructions; and token-comparison, W-token, X-token, Y-token, Z-token, w-bits, x-bits, y-bits, z-bits, A-format, B-format, C-format, and D-format information. Said preprogrammed instructions and information cause control processor, 39J, to determine the number of signal words of command information in said first message in precisely the same fashion that controller, 39, determined the number of signal words of command information in the second message in example #2. Automatically, control processor, 39J, selects information of the first L bits of information at said SPAM-input-signal memory immediately after the first H+X bits and records said information of L bits at SPAM-length-info memory. Said L bits are the length token of said message. Automatically control processor, 39J, determines that the information at said SPAM-length-info memory matches said W-token information, selects said w-bits information, and processes said information as the numeric value of MMS-L. Automatically, control processor, 39J, determines the number of signal words in the command information of said second message by adding H+X+L to said w-bits information of MMS-L and dividing the resulting sum by the number of bits in one signal word. Automatically control processor, 39J, places a "0" at particular SPAM-Flag-working register memory if said command information fills a whole number of signal words exactly and "1" at said memory if it does not. Automatically, control processor, 39J, then determines a particular number of signal words to transfer and place information of said number at particular working register memory.

Next said load-run-and-code instructions cause control processor, 39J,

to execute a fourth step of receiving SPAM signal information and commence receiving all remaining command information and padding bits in said first message. Automatically, control processor, 39J, commences accepting and EOFS valve, 39F, commences transferring additional SPAM signal words. Automatically, control processor, 39J, receives and records said words in sequence at said SPAM-input-signal memory immediately following the last of said third quantity of signal words until the total quantity of SPAM signal words recorded at said memory equals a particular fourth quantity. Said fourth quantity is the number at said working register memory. Then, automatically, control processor, 39J, compares the information at said SPAM-Flag-working register memory to particular information that is "0".

Not resulting in a match means that EOFS valve, 39F, has transferred and control processor, 39J, has recorded all command information of said first message together with any associated padding bits. Accordingly, not resulting in a match causes control processor, 39J, to cease accepting SPAM signal information from EOFS valve, 39F.

On the other hand, resulting in a match means that one full signal word of padding bits may follow the last signal word of said message that contains command information and that said last word must be evaluated to ascertain whether it contains MOVE bit information. Accordingly, under control of said preprogrammed instructions, resulting in a match causes control processor, 39J, to receive one additional signal word from EOFS valve, 39F, to compare said word to particular preprogrammed information of one EOFS WORD, and to record said word at said SPAM-input-signal memory immediately following the last of said fourth quantity of signal words. Said word is the last signal word of said message that contains command information. If said word matches said information of one EOFS WORD, one full signal word of padding bits follows said word, and said preprogrammed instructions cause control processor, 39J, to receive one more signal word from EOFS valve, 39F, and to record said word at said SPAM-input-signal memory immediately following said last signal word that contains command information. Then, whether or not a match has occurred with said information of one EOFS WORD, said preprogrammed instructions cause control processor, 39J, to cease accepting SPAM signal information from EOFS valve, 39F.

By receiving all command information and padding bits in said first message in the course of said four steps of receiving SPAM signal information, control processor, 39J, causes EOFS valve, 39F, to transfer every signal word in said first message prior to the first word of the information segment of said first message. Accordingly, the next signal word transferred by said valve, 39F, is the first word of said information segment, which is the first word of the program instruction set of the "Wall Street Week" combining.

Then said load-run-and-code instructions cause control processor, 39J, to commence loading information at the main RAM of microcomputer, 205. Automatically, under control of said instructions, control processor, 39J, causes matrix switch, 39I, to cease transferring information from EOFS valve, 39F, to control processor, 39J, and to commence transferring information from control processor, 39J, to the CPU of microcomputer, 205; transmits an instruction to said CPU that causes said CPU to commence receiving information from matrix switch, 39I, and loading said information at particular main RAM in a fashion well known in the art;

and causes matrix switch, 39I, to commence transferring information from EOFS valve, 39F, to said CPU. Automatically, microcomputer, 205, commences receiving the information of the program instruction set in said first message, beginning with the first signal word of said set, and loads said information at particular main RAM.

Then, while EOFS valve, 39F, processes the information of the information segment of said first message to detect the end of file signal and while microcomputer, 205, loads the information of said program instruction set at RAM, said load-run-and-code instructions cause control processor, 39J, to commence executing the code portion of said instructions. The instructions of said portion cause control processor, 39J, to compare the information at said SPAM-header memory to particular load-run-and-code-header information that is "01". A match results (which indicates that said first message contains meter-monitor information). Control processor, 39J is preprogrammed with evaluate-meter-monitor-format, process-this-specific-format, and locate-program-unit instructions and with format-specification information and offset-address information, and said match control processor, 39J, to locate the "program unit identification code" information in the information at said SPAM-input-signal memory and record information of said "code" information at SPAM-first-precondition register memory in the same fashion that SPAM-controller, 205C, performed these functions in example #1.

To locate said "code" information, said code portion instructions cause control processor, 39J, to execute said evaluate-meter-monitor-format instructions. Said instructions cause control processor, 39J, to select information of bits at particular predetermined locations at said SPAM-input-signal memory and record said information at SPAM-mm-format register memory. Said bits are the bits of the meter-monitor format field in said first message. Then said instructions cause control processor, 39J, to compare the information at said SPAM-mm-format memory with said format-specification information, determine a match with particular A-format information that invokes particular process-A-format instructions, and execute said instructions. Said instructions cause control processor, 39J, to place a particular A-offset-address number at said SPAM-mm-format memory (thereby overwriting and obliterating the information previously at said memory) which number specifies the address/location at the RAM associated with control processor, 39J, of the first bit of information that identifies the specific format of the meter-monitor segment in said first message.

Then said code portion instructions cause control processor, 39J, to execute the aforementioned locate-program-unit instructions. Said instructions cause controller, 39J, to add a particular preprogrammed program-unit-field-start-datum-location number to information of said A-offset-address number and record the resulting first sum then add a particular preprogrammed program-unit-field-length-datum-location number to information of said A-offset-address number and record the resulting second sum. Next said instructions cause control processor, 39J, to select preprogrammed binary information of a particular preprogrammed datum-cell-length number of contiguous bit locations that begin at said first sum number of bit locations after a particular predetermined first-bit location at said RAM and place said binary information at first-working register memory and to select preprogrammed binary information of said datum-cell-length number of contiguous bit locations

that begin at said second sum number of locations after said first-bit location and place said binary information at second-working register memory. In so doing, control processor, 39J, places at said first-working memory information of the bit distance from the first bit location of said SPAM-input-signal memory to the first bit location of said program unit field and places at said second-working memory information of the bit location length of said program unit field. Automatically, control processor, 39J, selects binary information of the second-working memory information number of contiguous bit locations at said SPAM-input-signal memory that begin at the first-working memory information number of bit locations after the first bit location at said memory. Automatically, control processor, 39J, places said binary information at said first-working memory. In so doing, control processor, 39J, selects information of the unique "program unit identification code" that identifies said "Wall Street Week" program.

Then said code portion instructions cause control processor, 39J, to place at the aforementioned SPAM-first-precondition memory information of said information at first working memory. In so doing, control processor, 39J, places said "code" at said memory. Then the final instructions of said portion cause control processor, 39J, place "1" at SPAM-Flag-primary-level-3rd-step-incomplete register memory (thereby overwriting and obliterating the "1" information at said memory), which "1" signifies the completion of the code step executed by said load-run-and-code instructions.

(At stations that are not preprogrammed to collect monitor information, each control processor, 39J, commences waiting for interrupt information of the end of file signal at the end of said first message from EOFS valve, 39F, when each completes the code portion of said load-run-and-code instructions.)

The station of FIG. 3 is preprogrammed to collect monitor information, and at any point where the control processor, 39J, of a station that is not so preprogrammed commences waiting, the control processor, 39J, of the station of FIG. 3 is preprogrammed automatically to execute particular preprogrammed collect-monitor-info instructions. Said instructions cause control processor, 39J, of the station of FIG. 3 to compare the information at said SPAM-Flag-monitor-info memory with particular preprogrammed "0" information. A match results. Under control of said instructions, said match causes control processor, 39J, to cause matrix switch, 39I, to commence transferring information from control processor, 39J, to buffer/comparator, 14, of signal processor, 200, (while said switch is simultaneously transferring information from control processor, 39J, to the CPU of microcomputer, 205); to transfer to said buffer/comparator, 14, header information that identifies a transmission of monitor information then particular decoder-203 information that is the source mark of said decoder, 203, (which source mark is binary information that is preprogrammed at control processor, 39J) then all of the received binary information of said first message that is recorded at said SPAM-input-signal memory; then to cause matrix switch, 39I, to cease transferring information from control processor, 39J, to said buffer/comparator, 14. (Said received information is complete information of the first combining synch command, and said information transmitted to buffer/comparator, 14, is called, hereinafter, the "1st monitor information (#3). Then control processor, 39J, enters "1" at said SPAM-Flag-monitor-info memory, signifying completion of the

transfer of said 1st monitor information (#3); completes said collect-monitor-info instructions; and commences waiting for interrupt information of end of file signal, transmitted by control transmission means.

In due course, EOFS valve, 39F, receives the last signal word of the information segment of said first message, which is the last signal word of said program instruction 7set, and transfers said word, via matrix switch, 39I, to microcomputer, 205, which causes microcomputer, 205, to load said word at said RAM.

Then said valve, 39F, commences receiving information of the eleven EOFS WORDs that constitute the end of file signal at the end of said first message. Receiving the first EOFS WORD of said eleven causes EOFS valve, 39F, to commence retaining information of said WORD, in the fashion described above, and to cease transferring information to microcomputer, 205. Accordingly, microcomputer, 205, ceases loading information at said RAM. Said valve, 39F, detects and retains information of the next nine EOFS WORDs in its end of file signal detection fashion. Then, receiving the eleventh and last EOFS WORD of said end of file signal causes EOFS valve, 39F, to increment the information at the EOFS WORD Counter of said valve, 39F, by one then determine that the information at said Counter matches the information at the EOFS Standard Length Location of said valve, 39F, which causes EOFS valve, 39F, to transmit EOFS-signal-detected information to control processor, 39J, as an interrupt signal then commence waiting for a control instruction from control processor, 39J.

Receiving an interrupt signal of EOFS-signal-detected information from an EOFS valve, 39F or 39H, while under control of any given set of preprogrammed controlled function instructions causes control processor, 39J, to execute a so-called "machine language jump" to a predesignated portion of said instructions, in a fashion well known in the art, and execute the instructions of said portion.

In the case of said load-run-and-code instructions, receiving an EOFS-signal-detected interrupt signal causes control processor, 39J, to jump to and execute the run portion of said instructions. Receiving the EOFS-signal-detected interrupt signal that the eleventh EOFS WORD of the end of file signal at the end of said first message causes EOFS valve, 39F, to transmit causes control processor, 39J, to jump to and execute instructions that begin with that particular one whose location is identified by the reentry-address information at the aforementioned SPAM-address-of-next-instruction-upon-primary-interrupt register memory. Said instructions are the instructions of said run portion. Automatically, said instructions cause control processor, 39J, to cause matrix switch, 39I, to cease transferring information from EOFS valve, 39F, to the CPU of microcomputer, 205, and to commence transferring information from control processor, 39J, to said CPU; to transmit a control instruction to said CPU that causes microcomputer, 205, to cease loading information at said main RAM and execute the information so loaded as so-called "machine executable code" of one so-called "job"; then to transmit the aforementioned discard-and-wait instruction, via control transmission means, to EOFS valve, 39F. In so doing, control processor, 39J, completes the instructions of said run portion.

Receiving said discard-and-wait instruction causes EOFS valve, 39F, to

set the information at said EOFS WORD Counter to "00000000", to transmit the aforementioned complete-and-waiting information to control processor, 39J, as a second interrupt signal, then to commence waiting for a further control instruction from control processor, 39J.

Automatically said load-run-and-code instructions cause control processor, 39J, to compare the information at said SPAM-Flag-primary-level-3rd-step-incomplete memory with particular preprogrammed "1" information. A match results which signifies that control processor, 39J, has already completed the code portion of said load-run-and-code instructions. Said match causes control processor, 39J, to complete said load-run-and-code instructions.

Having completed the controlled functions of said first message, automatically control processor, 39J, prepares to receive the next SP.AM message. Automatically, control processor, 39J, determines, in a predetermined fashion, that EOFS valve, 39F, is the primary input to control processor, 39J, of SPAM message information; causes matrix switch, 39I, to commence transferring information from EOFS valve, 39F, to control processor, 39J; then compares the information at said SPAM-header memory to particular preprogrammed cause-retention-of-exec information that is "01". A match results which causes control processor, 39J, to place at the aforementioned SPAM-last-01-header-exec register memory information of the information at said SPAM-exec memory. Being preprogrammed to collect monitor information, control processor, 39J, automatically compares the information at said SPAM-Flag-monitor-info memory with particular preprogrammed "0" information. No match results which indicates that control processor, 39J, has completed collect-monitor-info instructions in respect to said first message. Then, automatically, control processor, 39J, causes all apparatus of control processor, 39J, to delete from memory all information of said first message except information at said SPAM-first-precondition and SPAM-last-01-header-exec memories. Finally, after receiving said complete-and-waiting information from EOFS valve, 39F, control processor, 39J, causes said valve, 39F, to commence processing inputted signal words, in its preprogrammed detecting fashion, and outputting information to matrix switch, 39I, and control processor, 39J, commences waiting to receive information of a subsequent SPAM header from said switch, 39I.

As described in "One Combined Medium" above, running the information of said program instruction set causes microcomputer, 205, (and URS microcomputers, 205, at other subscriber stations) to place appropriate FIG. 1A image information at particular video RAM. In addition, running said set also causes microcomputer, 205, after completing placing said image information at said RAM, to transfer particular number-of-overlay-completed information and instructions to control processor, 39J. Said information and instructions cause control processor, 39J, to place the number "00000001" at particular SPAM-second-precondition register memory at control processor, 39J, signifying that said image information represents the first overlay of its associated video program.

Receiving said 1st monitor information (#3) causes buffer/comparator, 14, to compare the information, in said 1st information, of the header information that identifies a transmission of monitor information to particular preprogrammed header-identification-@14 information. A match results with particular monitored-instruction-fulfilled-identification

information which causes buffer/comparator, 14, to input said 1st monitor information (#3) to onboard controller, 14A.

Receiving said 1st monitor information (#3) causes onboard controller, 14A, to record the source mark information in said 1st information at particular source-mark-@14A register memory; to record at particular SPAM-input-signal-@14A register memory all of the received binary information of said first message that was recorded at the aforementioned SPAM-input-signal memory of controller, 39J; and to execute particular preprogrammed process-monitor-info instructions. (Onboard controller, 14A, processes the 1st monitor information (#3) upon receipt, and this processing can occur simultaneously with the loading of the program instruction set of said first message at RAM at microcomputer, 205, while control processor, 39J, waits to receive an EOFS-signal-detected signal from EOFS valve, 39F.) Automatically, said instructions cause onboard controller, 14A, to compare the information at said source-mark-@14A memory, in a predetermined fashion, with particular pre-entered source-identification mark information that onboard controller, 14A, retains in memory associated with its pre-entered signal records of monitor information. A match results with that particular decoder-203 source mark information that is associated with the aforementioned record of the prior programming displayed at monitor, 202M. Said match causes onboard controller, 14A, to locate the instance of "program unit identification code" information in the information at said SPAM-input-signal-@14A register memory in precisely the same fashion that the code portion instructions of the aforementioned load-run-and-code instructions caused controller, 39J, to locate "program unit identification code" information in information of said first message. (Onboard controller, 14A, is preprogrammed with all information necessary for locating and processing the information of all the meter-monitor fields in any monitor information transmission such as said 1st monitor information (#3)--said preprogrammed information includes, for example, format-specification information, A-format information, and locate-program-unit instructions.) Automatically, said process-monitor-info instructions cause onboard controller, 14A, in a predetermined fashion, to locate the instance of "program unit identification code" information in said record of the prior programming displayed at monitor, 202M, and to compare said first named instance of "program unit identification code" information to said second named instance. No match results.

Not resulting in a match causes onboard controller, 14A, to cause signal processor, 200, to record said record of prior programming at recorder, 16. Automatically, under control of said process-monitor-info instructions, onboard controller, transmits to controller, 20, a particular preprogrammed instruct-to-record instruction that causes controller, 20, to cause onboard controller, 14A, to transmit the monitor record of said prior programming to recorder, 16, in a predetermined fashion and that causes controller, 20, to cause recorder, 16, to record said monitor record information in a predetermined fashion. (Certain transfer functions caused by said transmission of instruct-to-record information are described more fully below in "Operating Signal Processing Systems . . . Signal Record Transfer.")

Then said process-monitor-info instructions cause onboard controller, 14A, to initiate a new monitor record that reflects the new "Wall Street Week" programming. Automatically, said instructions cause onboard

controller, 14A, in a predetermined fashion, to delete all information at the monitor record location of said monitor record of prior programming except the source mark information associated with said record; to record information of said first named instance of "program unit identification code" information (which is the "program unit identification code" of said "Wall Street Week" program to a particular "program unit identification code" location at said record location; to select particular information located at said SPAM-input-signal-@14A register memory and record information at said record location; to select particular preprogrammed record format information that identifies the format of the information at said record location and place information of said information at a particular location at said record location and, separately, at a particular format comparison location; and finally, to discard all unrecorded information of said 1st monitor information (#3) and commence waiting for the next inputted instance of monitor information.

The content of the 1st monitor information (#3) [more particularly, the information of the command execution segment and of the meter-monitor format field]causes onboard controller, 14A, to organize the information of said new monitor record in a particular fashion. The command execution segment of the 1st monitor information (#3) causes signal processor, 200, to assemble the this new monitor record in a particular format of a combined video/computer medium display and to include a particular record format field within said format identifying the format of said record. (Were the execution segment of said command of the aforementioned pseudo command, signal processor, 200, would initiate a record for a conventional television program.) From the command meter-monitor segment of the 1st monitor information (#3), onboard controller, 14A, selects and records at particular signal record field locations at said record location the information that identifies the program unit of the particular "Wall Street Week" program, the origin of the "Wall Street Week" transmission, and the day of the particular transmission within a one hundred year period. In a predetermined fashion, onboard controller, 14A, also records in a particular monitor record field location at said record location a particular display unit identification code that identifies monitor, 202M, as the display apparatus of said new monitor record. In a predetermined fashion, signal processor, 200', records date and time information received from clock, 18, in first and last particular time field locations at said record location that document the date and time respectively of the first and of the last received instances of monitor information of the particular program unit and source mark.

OPERATING S. P. SYSTEMS . . . EXAMPLE #3 (SECOND MESSAGE)

Subsequently, the embedded information of the second message of the "Wall Street Week" program is inputted to decoder, 203. Receiving said embedded information at decoder, 203, causes the SPAM information of said second message to be detected at detector 34; inputted to controller, 39, at buffer, 39A; checked and corrected, as necessary, at processor, 39B; converted into locally usable binary information at processor, 39D; and processed by EOFS valve, 39F, in the end of file signal detecting fashion of said valve, 39F, with all these functions occurring in the same fashions that applied to the SPAM information of the first message.

When EOFS valve, 39F, commences transferring the SPAM information of the

second message, receiving the information of the header of said message causes control processor, 39J, to commence processing the information of said message under control of the preprogrammed instructions at the RAM and ROM associated with said processor, 39J, and to process, in particular, the information of said header. Automatically, control processor, 39J, accepts the smallest number of signal words that can contain one instance of header information, records the information of said words in sequence at SPAM-input-signal register memory, then ceases accepting SPAM signal information transferred from EOFS valve, 39F. Automatically, control processor, 39J, selects information of the first H bits at said SPAM-input-signal memory and records said information of H bits at SPAM-header memory then compares the information at said SPAM-header memory to the aforementioned 11-header-invoking information that is "11". No match results.

Not resulting in a match causes control processor, 39J, first, to execute the aforementioned evaluate-message-content instructions then to receive and process the execution segment information in said second message. Automatically, control processor, 39J, compares the information at said SPAM-header memory with preprogrammed invoke-monitor-processing information. A match results with particular "00" information. Said match signifies the presence of meter-monitor information in said second message and causes control processor, 39J, to enter "0" at SPAM-Flag-monitor-info register memory that is normally "1". Then, automatically, control processor, 39J, commences accepting additional SPAM signal words from EOFS valve, 39F; receives and records additional words at said SPAM-input-signal memory, in sequence after the information already there, until the total quantity of SPAM signal words recorded at said memory equals the smallest number of signal words that can contain one instance of header and execution segment information; then ceases accepting SPAM signal information from EOFS valve, 39F. Automatically, control processor, 39J, selects information of the first X bits of information at said SPAM-input-signal memory immediately after the first H bits, records said information of X bits at said SPAM-exec memory, and compares the information at said SPAM-exec memory with controlled-function-invoking information that is preprogrammed at the RAM and/or ROM associated with said processor, 39J. A match results with the aforementioned execute-conditional-overlay-at-205 information that is identical to the execute-conditional-overlay-at-205 information preprogrammed at SPAM-controller, 205C, of example #1. Said match causes control processor, 39J, to execute the aforementioned conditional-overlay-at-205 instructions. Said instructions cause SPAM-controller, 205C, to execute "GRAPHICS ON" at the PC-MicroKey System of microcomputer, 205, if the information of the program unit field in the meter-monitor information of said second message matches the information at said SPAM-first-precondition register memory and the information of the overlay number field in said meter-monitor information matches the information at said SPAM-second-precondition register memory.

Automatically, said conditional-overlay-at-205 instructions cause control processor, 39J, to receive and process the length token information in said second message. Automatically, control processor, 39J, recommences accepting additional SPAM signal words from EOFS valve, 39F; receives and records additional words at said SPAM-input-signal memory, in sequence after the information already there, until the total quantity of SPAM signal words recorded at said memory equals the smallest number of signal words that can contain one instance of header, execution

segment, and length token information; then ceases accepting SPAM signal information from EOFS valve, 39F. Under control of the same preprogrammed instructions that controlled the processing of the length token of the first message, control processor, 39J, processes the length token of the second message in the same fashion that applied to the first message but with one exception. Control processor, 39J, determines that the length token of said second message matches X-token information, when compared with token-comparison information, rather than Y-token information (which was the information matched by the length token information of the second message of example #2). Said match causes control processor, 39J, to select x-bits information, place said information at SPAM-length-info memory, and process said x-bits information as the numeric value of MMS-L. Then, in precisely the same fashion that applied in the case of the first message, control processor, 39J, determines a particular number of signal words to transfer and places information of said number at particular working register memory.

Next said conditional-overlay-at-205 instructions cause control processor, 39J, to receive all remaining command information and padding bits of said second message and to load said information and bits at said SPAM-input-signal memory in precisely the same fashion that applied in the case of the first message. Automatically, control processor, 39J, recommences accepting additional SPAM signal words from EOFS valve, 39F, and receives and records additional words at said SPAM-input-signal memory, in sequence after the information already there, until the total quantity of SPAM signal words recorded at said memory equals the number at said working register memory. Then, if the command information in said second message does not fill a whole number of signal words exactly, control processor, 39J, automatically ceases accepting SPAM signal information from EOFS valve, 39F. But if, instead, said command information does fill a whole number of signal words exactly, automatically control processor, 39J, receives one additional signal word from EOFS valve, 39F; compares said word to information of one EOFS WORD; records said word at said SPAM-input-signal memory immediately following the information already recorded at said memory; receives one more signal word from EOFS valve, 39F, and records said word at said SPAM-input-signal memory immediately following the information of said one additional signal word if said additional word matched said information of one EOFS WORD at the aforementioned comparing; and ceases accepting SPAM signal information from EOFS valve, 39F.

By receiving all command information and padding bits in said second message, control processor, 39J, causes EOFS valve, 39F, to transfer every signal word in said message. Accordingly, the next signal word to be transferred by said valve, 39F, is the first word of the next message embedded in the "Wall Street Week" programming transmission after said second message.

Then, in order to locate the information of the program unit and overlay number fields in the meter-monitor information of said second message, said conditional-overlay-at-205 instructions cause control processor, 39J, to execute said evaluate-meter-monitor-format instructions and said instructions cause control processor, 39J, to place a selected offset-address number at SPAM-mm-format memory in the same fashion that applied in the case of the first message. Automatically, control processor, 39J, selects information of the bits of the meter-monitor format field in said first message, records said information at

SPAM-mm-format register memory, compares the information at said memory with format-specification information, determines a match with B-format information that invokes process-B-format instructions that cause control processor, 39J, to place at said SPAM-mm-format memory a particular B-offset-address number that is different from the aforementioned A-offset-address number and that specifies the RAM address/location of the first bit of information that identifies the specific format of the meter-monitor segment in said second message.

Then said conditional-overlay-at-205 instructions cause control processor, 39J, to execute the aforementioned locate-program-unit instructions and locate the program unit field in the meter-monitor information of said second message in the same fashion that applied in the case of the first message. Automatically, controller, 39J, adds the aforementioned program-unit-field-start-datum-location number to information of said B-offset-address number and records the resulting first sum then adds the aforementioned program-unit-field-length-datum-location number to information of said B-offset-address number and records the resulting second sum. Next said instructions cause control processor, 39J, to select information of the starting bit location of said program unit field which information is the number of bit locations from the first bit location at said SPAM-input-signal memory to the first bit location of said field. Automatically, control processor, 39J, places said information at first-working register memory then selects second information of the length of said program unit field in contiguous bit locations and places said second information at second-working register memory. Automatically, control processor, 39J, selects binary information of the second-working memory information number of contiguous bit locations at said SPAM-input-signal memory that begin at the first-working memory information number of bit locations after the first bit location at said memory. Automatically, control processor, 39J, places said binary information at said first-working memory. In so doing, control processor, 39J, places at said memory information of the unique "program unit identification code" that identifies the program unit of said "Wall Street Week" program.

Then said conditional-overlay-at-205 instructions cause control processor, 39J, to compare the information at said first-working memory to the information at the aforementioned SPAM-first-precondition register memory (which is the same unique code). A match results (which indicates that control processor, 39J, executed the aforementioned load-run-and-code instructions under control of the first message.) Said match causes control processor, 39J, to continue executing said conditional-overlay-at-205 instructions.

(As described in the case of the second message of example #1, at any subscriber station where information at first-working register memory fails to match information at SPAM-first-precondition register memory, said failing to match causes the control processor, 39J, of said station to clear all SPAM information from main and video RAMs of the microcomputers, 205, of said stations and, themselves, to discard all information of said second message and commence waiting for the binary information of a subsequent SPAM header.)

Next said conditional-overlay-at-205 instructions cause control processor, 39J, to execute the aforementioned locate-overlay-number instructions and locate the overlay number field in said meter-monitor

information in the same fashion that the information of the program unit field is located. Said locate-overlay-number instructions cause controller, 39J, to add a particular preprogrammed overlay-number-field-start-datum-location number (that is different from the aforementioned program-unit-field-start-datum-location number) to information of said B-offset-address number and record the resulting first sum then add a particular preprogrammed overlay-number-field-length-datum-location number to information of said B-offset-address number and record the resulting second sum. Next said instructions cause control processor, 39J, to select preprogrammed binary information of the aforementioned datum-cell-length number of contiguous bit locations that begin at said first sum number of bit locations after the aforementioned first-bit location at said RAM and place said binary information at first-working register memory and to select preprogrammed binary information of said datum-cell-length number of contiguous bit locations that begin at said second sum number of locations after said first-bit location and place said binary information at second-working register memory. In so doing, control processor, 39J, places at said first-working memory information of the bit distance from the first bit location of said SPAM-input-signal memory to the first bit location of said overlay number field and places at said second-working memory information of the number of contiguous bit locations in said overlay number field. Automatically, control processor, 39J, selects binary information of the second-working memory information number of contiguous bit locations at said SPAM-input-signal memory that begin at the first-working memory information number of bit locations after the first bit location at said memory. Automatically, control processor, 39J, places said binary information at said first-working memory (thereby overwriting and obliterating the information previously there). In so doing, control processor, 39J, selects from the information at said SPAM-input-signal memory and records at said first-working memory the information of said overlay number field. (After the information of said overlay field is placed at said memory, the information at said memory is "00000001".)

Then said conditional-overlay-at-205 instructions cause control processor, 39J, to compare the information at said first-working memory to the "00000001" information at the aforementioned SPAM-second-precondition register memory. A match results (indicating that microcomputer, 205, has completed placing appropriate FIG. 1A image information at video RAM)

(As described in the case of the second message of example #1, at any subscriber station where information at first-working register memory fails to match information at SPAM-second-precondition memory, the control processor, 39J, of said station interrupts the operation of the CPU of said microcomputer, 205, in an interrupt fashion well known in the art, and causes said microcomputer, 205, to restore efficient operation in a fashion described more fully below.)

At the subscriber station of FIG. 3 (and at URS microcomputers, 205, at other subscriber stations where information at first-working memory matches information at SPAM-second-precondition memory), said match causes control processor, 39J, to cause matrix switch, 39I, to cease transferring information from EOFS valve, 39F, to control processor, 39J, and commence transferring information from control processor, 39J, to the PC-MicroKey System of microcomputer, 205; to transmit the instruction, "GRAPHICS ON", to said PC-MicroKey System; and to complete said

conditional-overlay-at-205 instructions, the controlled functions of the second combining synch command, and the controlled functions of said second message.

At the subscriber station of FIG. 3 (and at URS microcomputers, 205, at other subscriber stations), said instruction, "GRAPHICS ON", causes said PC-MicroKey System to combine the programming of FIG. 1A and of FIG. 1B and transmit the combined programming to monitor, 202M, where FIG. 1C is displayed.

Automatically, the preprogrammed instructions that control control processor, 39J, cause said processor, 39J, to prepare to receive the next SPAM message. Automatically, control processor, 39J, determines, in a predetermined fashion, that EOFS valve, 39F, is the primary input to control processor, 39J, of SPAM message information; causes matrix switch, 39I, to commence transferring information from EOFS valve, 39F, to control processor, 39J; determines that the information at said SPAM-header memory does not match the aforementioned cause-retention-of-exec information that is "01".

Then, being preprogrammed to collect monitor information, control processor, 39J, automatically compares the information at said SPAM-Flag-monitor-info memory with particular preprogrammed "0" information. A match results. Said match causes control processor, 39J, to execute particular ones of its preprogrammed collect-monitor-information instructions. Under control of said ones, control processor, 39J, transfers to the buffer/comparator, 14, of signal processor, 200, header information that identifies a transmission of monitor information then the aforementioned decoder-203 source mark information then all of the received binary information of said second message that is recorded at said SPAM-input-signal memory. (Said information is complete information of the second combining synch command, and said information transmitted to buffer/comparator, 14, is called, hereinafter, the "2nd monitor information (#3).") Then control processor, 39J, enters "1" at said SPAM-Flag-monitor-info memory, completes said collect-monitor-info instructions, and continues the conventional preprogrammed instructions of said control processor, 39J.

Automatically control processor, 39J, deletes from memory all information of said second message and commences waiting to receive the binary information of a subsequent SPAM header from matrix switch, 39I.

At signal processor, 200, receiving said 2nd monitor information (#3) causes buffer/comparator, 14, to determine that the header information, in said 2nd monitor information (#3), that identifies a transmission of monitor information matches the aforementioned monitored-instruction-fulfilled-identification information which causes buffer/comparator, 14, to input said 2nd monitor information (#3) to onboard controller, 14A.

Receiving said 2nd monitor information (#3) causes onboard controller, 14A, to record the source mark information in said 2nd monitor information (#3) at source-mark-@14A 14A register memory; to record, at particular SPAM-input-signal-@14A register memory, all of the received binary information of said first message that was recorded at the aforementioned SPAM-input-signal memory of controller, 39J; and to execute the aforementioned process-monitor-info instructions. Said instructions cause onboard controller, 14A, to compare the information at

said source-mark-@14A memory with the aforementioned source-identification information. A match results with the aforementioned decoder-203 source mark information. Said match causes onboard controller, 14A, to locate the instance of "program unit identification code" information at said SPAM-input-signal-@14A register memory, in the fashion described above; to locate the instance of "program unit identification code" information in the aforementioned new monitor record; and to compare said first named instance to said second named instance. A match results. Under control of said process-monitor-info instructions, said match causes onboard controller, 14A, to record date and time information, received from clock, 18, at the aforementioned last particular time field of said new monitor record and, in a predetermined fashion, to compare the meter-monitor format field at said SPAM-input-signal-@14A register memory to the aforementioned record format field associated with said monitor record. No match results which indicates that said 2nd monitor information (#3) contains new information. Not resulting in a match causes onboard controller, 14A, in a predetermined fashion, to evaluate said new information and modify the information content of said new monitor record by adding and/or deleting and/or replacing information. One element of information modified at said new monitor record is said record format information which is replaced with new record format information that specifies the format in which the information of said new record is organized. Finally, said process-monitor-info instructions cause onboard controller, 14A, to discard all unrecorded information of said 2nd monitor information (#3) and commence waiting for the next inputted instance of monitor information.

The new information content of the 2nd monitor information (#3) causes controller, 20, to modify the information of said new monitor record in a particular fashion. The command meter-monitor segment information of the minute of the particular transmission within a particular one month period provides new information. By comparing said information with date and time information from clock, 18, in a predetermined fashion, controller, 20, determines whether said "Wall Street Week" programming is being displayed at the time of its original transmission or whether it has been so-called "time shifted"; that is, recorded at one time an a receiver station video tape recorder and played back at a subsequent time. If controller, 20, determines that the time of clock, 18, is the time of original transmission (plus or minus particular error parameter information), controller, 20, deletes the information of the day of the particular transmission within a one hundred year period from said monitor record, modifies the record format field with information that distinguishes said new record as a record of a display of an original transmission, and enters all other recorded information of said new monitor record into the particular fields of said format. If controller, 20, determines that the original transmission has been time shifted, controller, 20, modifies the record format field with information that distinguishes said new record as a record of a time shifted display, enters all previously recorded information within the proper fields of said format, and records the new information of the minute of the particular transmission within a particular one month period.

The particular overlay information of the command meter-monitor segment of the 2nd monitor information (#3) also provides new information. Controller, 20, uses said particular overlay information in several fashions. It records in a particular field of said new monitor record a

count, starting with "1" for said first overlay, of the number of overlays processed in the course of said program unit. It increments by one a separate monitor record count of the aggregate number of overlays displayed at monitor, 202M, over a particular calendar month period. And it increments by one a separate monitor record count of the aggregate number of combinings processed by all receiver station apparatus over a particular time period.

Operating S. P. Systems . . . Example #3(Third Message)

Subsequently, the embedded information of the third message of the "Wall Street Week" program is inputted to decoder, 203. Just as with the information of the first and second messages, receiving the embedded information of said third message causes the SPAM information of said message to be detected at detector, 34, and inputted to controller, 39, at buffer, 39A; checked and corrected, as necessary, at processor, 39B; converted into locally usable binary information at processor, 39D; and processed for end of file signal information at EOFS valve, 39F.

When EOFS valve, 39F, commences transferring the SPAM information of said third message, control processor, 39J, automatically accepts the smallest number of signal words that can contain one instance of header information, records the information of said words in sequence at SPAM-input-signal register memory, then ceases accepting SPAM signal information transferred from EOFS valve, 39F. Automatically, control processor, 39J, selects information of the first H bits at said SPAM-input-signal memory, records said information of H bits at SPAM-header memory, and compares the information at said SPAM-header memory to the aforementioned 11-header-invoking information that is "11". No match results.

Not resulting in a match causes control processor, 39J, first, to execute evaluate-message-content instructions then to receive and process the execution segment information in said third message. Automatically, control processor, 39J, compares the information at said SPAM-header memory with preprogrammed invoke-monitor-processing information. No match results which signifies the absence of meter-monitor information in said third message. Accordingly, the information at said SPAM-Flag-monitor-info register memory remains "1". Then control processor, 39J, recommences accepting additional SPAM signal words from EOFS valve, 39F; receives and records additional words at said SPAM-input-signal memory, in sequence after the information already there, until the total quantity of SPAM signal words recorded at said memory equals the smallest number of signal words that can contain one instance of header and execution segment information; then ceases accepting SPAM signal information from EOFS valve, 39F. Automatically, control processor, 39J, selects information of the first X bits of information at said SPAM-input-signal memory immediately after the first H bits, records said information of X bits at said SPAM-exec memory, and compares the information at said SPAM-exec memory with controlled-function-invoking information that is preprogrammed at the RAM and/or ROM associated with said processor, 39J. A match results with the aforementioned cease-overlay information causing control processor, 39J, to execute the aforementioned cease-overlaying-at-205 instructions.

Automatically, said instructions cause control processor, 39J, to cause matrix switch, 39I, to cease transferring information from EOFS valve,

39F, to control processor, 39J, and commence transferring information from control processor, 39J, to the PC-MicroKey System of microcomputer, 205; to transmit the instruction, "GRAPHICS OFF", to said PC-MicroKey System; to cause matrix switch, 39I, to cease transferring information from control processor, 39J, to said PC-MicroKey System and commence transferring information from control processor, 39J, to the CPU of microcomputer, 205; then to transmit the aforementioned clear-and-continue instruction (the function of which is described more fully below) to said CPU; and finally, to cause matrix switch, 39I, to cease transferring information from control processor, 39J, to said CPU. In so doing, control processor, 39J, completes said cease-overlaying-at-205 instructions.

At the subscriber station of FIG. 3 (and at URS microcomputers, 205, at other subscriber stations), said instruction, "GRAPHICS OFF", causes said PC-MicroKey System to cease combining the programming of FIG. 1A and of FIG. 1B and commence transmitting to monitor, 202M, only the composite video programming received from divider, 4, (which causes monitor, 202M, to commence displaying only said video programming). And said clear-and-continue instruction causes microcomputer, 205, to commence processing in a predetermined fashion (which fashion may be determined by the aforementioned program instruction set).

Having completed the controlled functions of said third message, the conventional control instructions that control control processor, 39J, cause said processor, 39J to prepare to receive the next instance of SPAM message information in the following fashion.

Automatically, control processor, 39J, determines, in a predetermined fashion, that EOFS valve, 39F, is the primary input to control processor, 39J, of SPAM message information; causes matrix switch, 39I, to commence transferring information from EOFS valve, 39F, to control processor, 39J; determines that the information at said SPAM-header memory does not match said cause-retention-of-exec information that is "01"; then, being preprogrammed to collect monitor information, compares the information at said SPAM-Flag-monitor-info monitor-info memory with particular preprogrammed "0" information. No match results, and receiving said third message does not cause control processor, 39J, to transmit monitor information to buffer/comparator, 14, of signal processor, 200. Automatically, control processor, 39J, completes said collect-monitor-info instructions and continues the conventional preprogrammed instructions of said control processor, 39J.

Automatically control processor, 39J, deletes from memory all information of said third message, but in so doing, control processor, 39J, may perform particular functions that are not performed in deleting from memory information of the first and second messages. Control processor, 39J, has received all command information in said third message but may not have received all padding bits. If the command information in the smallest number of signal words that can contain one instance of header and execution segment information fills a whole number of signal words exactly, the last signal word of said command information may contain no MOVE bits and be followed by one full signal word of padding bits. To ensure that all padding bits of said third message are transferred from EOFS valve, 39F, control processor, 39J, is preprogrammed with particular additional conventional instructions if H+X fills a whole number of signal words exactly. Before information of said

third message at said SPAM-header memory is deleted, said particular instructions cause control processor, 39J, to compare said information to particular preprogrammed "10" information. A match results which causes control processor, 39J, under control of said particular instructions, to compare the last signal word of information at said SPAM-input-signal memory to information of one EOFS WORD; to receive one additional signal word from EOFS valve, 39F, if said last word matches said information of one EOFS WORD; then to cease accepting SPAM signal information from EOFS valve, 39F. In this fashion, control processor, 39J, ensures automatically that the next signal word to be transferred by said valve, 39F, will be the first word of the next message embedded in the "Wall Street Week" programming transmission after said third message.

Then, having deleted from memory all information of said third message, automatically control processor, 39J, commences waiting to receive the binary information of a subsequent SPAM header from matrix switch, 39I.

Operating Signal Processor Systems . . . Example #4

In example #4, the first and second messages are both partially encrypted, and the combining of FIG. 1A and FIG. 1B information occurs only at selected subscriber stations where the information of said messages causes decrypting and collecting of meter information as well as combining. In addition, the information of said messages also causes the collecting of monitor information at selected ones of said selected stations which selected ones are preprogrammed to collect monitor information in the fashion of example #3. In example #4, all appropriate apparatus of the subscriber station of FIG. 3 are preprogrammed to collect monitor information, and buffer/comparator, 14, operates under control of the aforementioned on-board controller, 14A, in fashions elaborated on below.

Example #4 elaborates on the process of monitor information collection in one particular respect. The second message of example #2 causes particular monitor information to be recorded at those particular stations, preprogrammed to collect monitor information, where microcomputers, 205, fail to satisfy either condition of the invoked conditional-overlay-at-205 instructions. Thus the monitor information collected in example #4 documents not only what programming is displayed at the subscriber station monitors, 202M, of the present invention but also the efficiency of the operation of the system of subscriber station microcomputers, 205. Said monitor information also provides statistics on those particular subscriber stations that tune to and process the programming of said "Wall Street Week" program but cannot display FIG. 1C combined medium image information because said particular stations are preprogrammed with decryption key information of J but not of Z. Such statistics enable programming suppliers to evaluate their strategies for marketing and pricing programming.

In example #4, before the first message is embedded at the "Wall Street Week" program originating studio and transmitted, all information of the execution segment, the meter-monitor segment, and the program instruction set in the information segment are encrypted, using standard encryption techniques that encrypt binary information without altering the number of bits in said information. However, the cadence information of said message remains unencrypted. More precisely, the "01" header, any padding bits added at the end of the information segment, and the end of file

signal that ends said message remain unencrypted. (The length token and any padding bits at the end of the command information in a message that ends with an end of file signal are not, strictly speaking, cadence information because they provide no information as to the location of the header that follows such a message.) Like the second message of example #2, the first message of example #4 is only partially encrypted in order to enable subscriber stations that lack capacity to decrypt said message to process accurately the cadence information of said message.

In example #4, the encryption of the execution segment of said first message is done in such a fashion that, after encryption, said segment is identical to a particular execution segment that addresses URS signal processors, 200, and instructs said processors, 200, to use a particular decryption key Z (different from the decryption key J that decrypted the second message of example #2) and decrypt the message in which said segment occurs.

Because said first message is encrypted, its meter-monitor segment contains a seventh field: a meter instruction field. Accordingly, the length of said first message, the number of bits in its meter-monitor segment, the information of the meter-monitor format field, and the numeric value of MMS-L is greater in example #4 than in example #1 and example #3.

As described above in "One Combined Medium," before any messages of the "Wall Street Week" programming are transmitted, control invoking instructions are embedded at said program originating studio and transmitted to all subscriber stations. Among said instructions are particular instructions, cited in example #2, that set PC-MicroKey Model 1300 Systems to the "Graphics Off" mode, and also instructions that command URS microcomputers, 205, to clear all RAM (except RAM containing operating system information). In addition (and not described in "One Combined Medium"), said instructions also include particular instructions that cause information of zero to be placed at the aforementioned SPAM-first-precondition and SPAM-second-precondition register memories. Accordingly, at the outset of example #4, no PC-MicroKey 1300 is in "Graphics On" mode; no microcomputer, 205, contains any image information at video RAM; and no "program unit identification code" information exists at the SPAM-first-precondition register memory of any control processor, 39J.

At the outset of example #4, information of "1" is at each of the aforementioned SPAM-Flag-monitor-info, SPAM-Flag-at-secondary-control-level, SPAM-Flag-executing-secondary-command, SPAM-Flag-secondary-level-incomplete, SPAM-Flag-primary-level-2nd-step-incomplete, SPAM-Flag-primary-level-3rd-step-incomplete, SPAM-Flag-secondary-level-2nd-step-incomplete, SPAM-Flag-secondary-level-3rd-step-incomplete, SPAM-Flag-first-condition-failed, SPAM-Flag-second-condition-failed, and SPAM-Flag-do-not-meter register memories, and matrix switch, 39I is configured to transfer SPAM message information from EOFS valve, 39F, to control processor, 39J.

Example #4 begins, like example #3, with divider, 4, transferring the embedded information of said first message to decoder, 203. In the same fashion that applied in example #3, receiving said embedded information at decoder, 203, causes the binary SPAM information of said first message to be received, with error correcting information, at decoder, 203;

detected at detector, 34; inputted to controller, 39, at buffer, 39A; checked and corrected, as necessary, at processor, 39B; converted into locally usable binary information at processor, 39D; and processed for end of file signal information at EOFS valve, 39F.

Receiving said first message causes the apparatus of the station of FIG. 3, in the following fashion, to decrypt the encrypted portions of said message; to execute the controlled functions of the decrypted information of said message; to collect meter information and monitor information relating to said message; and in the fashion described more fully below in "Operating Signal Processing Systems . . . Signal Record Transfer," to transfer meter information and monitor information to one or more remote processing stations, causing said stations to process said information.

When EOFS valve, 39F, commences transferring the SPAM message information of said first message, control processor, 39J, automatically accepts the smallest number of signal words that can contain H bits; records the information of said words at SPAM-input-signal register memory; ceases accepting SPAM message information from EOFS valve, 39F; selects information of the first H bits at said SPAM-input-signal memory; records said information at SPAM-header memory; and compares the information recorded at said memory to the aforementioned 11-header-invoking information that is "11". No match results.

Not resulting in a match causes control processor, 39J, first, to execute the aforementioned evaluate-message-content instructions (because the stations of FIG. 3 is preprogrammed to collect monitor information) then to receive and process the execution segment information in said first message. Automatically, control processor, 39J, compares the information at said SPAM-header memory with preprogrammed invoke-monitor-processing information. A match results with particular "01" information. Said match signifies the presence of meter-monitor information (albeit encrypted) in said first message and causes control processor, 39J, to enter "0" at the aforementioned SPAM-Flag-monitor-info register memory. Then control processor, 39J, recommences accepting additional SPAM signal words from EOFS valve, 39F; receives and records said words at said SPAM-input-signal memory, in sequence after the information already there, until the total quantity of SPAM signal words recorded at said memory equals the smallest number of signal words that can contain H+X bits; ceases accepting SPAM signal information from EOFS valve, 39F; selects information of the first X bits of information at said SPAM-input-signal memory immediately after the first H bits; records said information at said SPAM-exec memory, and compares the information at said memory with the aforementioned controlled-function-invoking information. A match results with particular preprogrammed this-message-addressed-to-200 information.

In examples #1 and #2, whenever controller, 39, determined matches with either this-message-addressed-to-205 information or this-message-addressed-to-200 information, controller, 39, transferred the entire message containing the identified information to the addressed apparatus. But in the preferred embodiment, controller, 39, may be preprogrammed to transfer, by control information transmission means, only particular information of any given message that contains this-message-addressed-to-200 information. The first and second messages of example #4 illustrate instances of such transferring.

Said match with this-message-addressed-to-200 information causes control processor, 39J, automatically to execute particular preprogrammed transfer-header-and-exec-seg-info-to-200 instructions. Automatically, said instructions cause control processor, 39J, to transfer to controller, 20, of signal processor, 200, via control information transmission means, an interrupt signal that interrupts the operation of said controller, 20, in a fashion well known in the art, then particular process-this-message information then particular at-39J information that identifies control processor, 39J, as the source of the transmission of said process-this-message information then information of the header and execution segment of said first message (that is, information of the information recorded at said SPAM-header and SPAM-exec memories).

Receiving said interrupt signal and information causes controller, 20, to compare the information of said execution segment to the aforementioned controlled-function-invoking-@200 information and determine a match with particular decrypt-with-key-Z information that instructs controller, 20, to cause the decryption of the received binary signal information of said first message with decryption key Z.

(At subscriber stations whose URS signal processors, 200, are not preprogrammed with information of said key Z, the information of said execution segment fails to match any controlled-function-invoking-@200 information. Automatically, failing to match causes the controllers, 20, of said stations to cause the control processors, 39J, of said stations to discard all information of said first message by causing matrix switch, 39I, to transfer all information inputted from EOFS valve, 39F, to its null 5 output; then causing EOFS valve, 39F, to transfer all received SPAM information until an end of file signal is detected; then, after said signal is detected, causing said valve, 39F, to discard its recorded information of said end of file signal; causing matrix switch, 39I, to commence transferring all information inputted from EOFS valve, 39F, to control processor, 39J; and, itself, deleting all recorded information of said message and commencing to wait for inputted information of a SPAM header.)

However, the subscriber station of FIG. 3 is preprogrammed with all information needed to decrypt said first message. The aforementioned at-39J information and match with decrypt-with-key-Z information cause controller, 20, to execute particular preprogrammed decrypt-with-Z-at-39K instructions. Said instructions cause controller, 20, to select particular preprogrammed key information of Z and transfer said key information to decryptor, 39K, of controller, 39. Then said decrypt-with-Z-at-39K instructions cause controller, 20, to compare said information of the header transferred from control processor, 39J, to particular preprogrammed header-identification-@200 information and to determine that said information of the header matches particular "01" header information. Said match causes controller, 20, automatically to transmit a particular decrypt-in-a-01-or-11-header-message-fashion instruction to decryptor, 39K.

Receiving said key information and said last named instruction causes decryptor, 39K, to commence using said key information as its key for decryption and decrypting inputted information in a predetermined 01-or-11-header-message fashion that is described more fully below.

Then said decrypt-with-Z-at-39K instructions cause controller, 20, to

transmit to control processor, 39J, a particular decrypt-process-and-meter-a-01-or-11-header-message instruction and particular decryption mark information of key Z that identifies Z as the decryption key. Receiving said instruction and mark information causes control processor, 39J, to record said mark information at the aforementioned SPAM-decryption-mark register memory, to enter "1" at the aforementioned SPAM-Flag-monitor-info register memory because any meter-monitor information in the SPAM message being processed is encrypted, then to execute particular preprogrammed decrypt-process-and-meter-current-01-or-11-header-message instructions.

Said instructions cause control processor, 39J, first, to identify EOFS valve, 39F, in a predetermined fashion, as the primary source of input SPAM message information; to place particular from-39F information at the aforementioned SPAM-primary-input-source register memory; and to place information of a particular reentry-address at the aforementioned SPAM-address-of-next-instruction-upon-primary-interrupt register memory which reentry-address specifies the location of the next decrypt-process-and-meter-current-01-or-11-header-message instruction to be executed when interrupt information of end of file signal detected information is next received by control processor, 39J, from said primary source of input SPAM message information, EOFS valve, 39F.

Then said instructions cause control processor, 39J, to transfer to decryptor, 39K, the SPAM message associated with the particular information at the SPAM-header memory of control processor, 39J. Automatically, said instructions cause control processor, 39J, to cause matrix switch, 39I, to cease transferring information from EOFS valve, 39F, to control processor, 39J, and commence transferring information from control processor, 39J, to decryptor, 39K. Then said instructions cause control processor, 39J, to transfer all SPAM message information recorded at said SPAM-input-signal memory of control processor, 39J. Said information is all the information of said first message that EOFS valve, 39F, has already transferred. Automatically, decryptor, 39K, commences receiving SPAM signal information. Then said instructions cause control processor, 39J, to cause matrix switch, 39I, to cease transferring information from control processor, 39J, to decryptor, 39K, and to commence transferring SPAM message information from EOFS valve, 39F, to decryptor, 39K. As decryptor, 39K, then accepts transferred information from matrix switch, 39I, automatically EOFS valve, 39F, commences transferring SPAM signal information, beginning with the first signal word of said first message that is immediately after the information of said first message that EOFS valve, 39F, has already transferred. In this fashion, control processor, 39J, causes all information of said first message to be transferred to decryptor, 39K.

Then said decrypt-process-and-meter-current-01-or-11-header-message instructions cause control processor, 39J, to prepare to receive the decrypted information of said first message and to execute, at a secondary control level under primary control of said decrypt-process-and-meter-current-01-or-11-header-message instructions, the controlled functions invoked by said decrypted information. Under control of said decrypt-process-and-meter-current-01-or-11-header-message instructions, control processor, 39J, places information of a particular reentry-address at the aforementioned SPAM-next-primary-instruction-address register memory which reentry-address specifies the location of the next decrypt-process-and-meter-current-01-or-11-header-message

instruction to be executed when control of control processor, 39J, reverts from the secondary control level to the primary control level; places information of "0" at the aforementioned SPAM-Flag-primary-level-2nd-step-incomplete register memory and, separately, at SPAM-Flag-primary-level-3rd-step-incomplete register memory which information signifies that specific primary level functions have not been completed; places information of "0" at the aforementioned SPAM-Flag-secondary-level-incomplete register memory that is normally "1" which information signifies that secondary control level functions have not been completed; compares the information at said SPAM-header memory to cause-retention-of-exec information that is "01" and places information of said information at SPAM-exec register memory at said SPAM-last-01-header-exec register memory because a match results; compares the information at said SPAM-Flag-monitor-info memory with particular preprogrammed "0" information and skips all steps of collecting monitor information because no match results; causes all apparatus of control processor, 39J, to delete from memory all information of said first message except information at said SPAM-last-01-header-exec, SPAM-decryption-mark, SPAM-Flag-at-secondary-control-level, SPAM-Flag-primary-level-2nd-step-incomplete, SPAM-Flag-primary-level-3rd-step-incomplete, SPAM-primary-input-source, SPAM-next-primary-instruction-address register memories; places particular from-39H information at the aforementioned SPAM-secondary-input-source register memory that identifies EOFS valve, 39H, as the secondary level source of input SPAM message information; causes matrix switch, 39I, to commence transferring SPAM message information from EOFS valve, 39H to control processor, 39J; places information of "0" at the aforementioned SPAM-Flag-executing-secondary-command register memory which information signifies that information placed subsequently at SPAM-exec register memory is secondary command level information; places information of "0" at the aforementioned SPAM-Flag-at-secondary-level register memory that is normally "1" which information signifies that control functions are being executed at said secondary level; and commences waiting to receive information of a subsequent SPAM header from said switch, 39I.

As decryptor, 39K, receives SPAM message information from matrix switch, 39I, decryptor, 39K, decrypts said information, using decryption key Z, in the aforementioned 01-or-11-header-message fashion and transfers the decrypted information to buffer, 39G. The aforementioned decrypt-in-a-01-or-11-header-message-fashion instruction causes decryptor, 39K, to transfer the first H bits received from matrix switch, 39I, without decrypting or altering said bits in any fashion then to decrypt and transfer all information following said first H bits. In this fashion, the cadence information of the header in said first message, which is not encrypted, is transferred by decryptor, 39K, to buffer, 39G, without alteration.

As buffer, 39G, receives said decrypted information, buffer, 39G, buffers said information and transfers it to EOFS valve, 39H. EOFS valve, 39H, checks said information for end of file signal information, in its preprogrammed end of file signal detection fashion, and transfers information that is not end of file signal, via matrix switch, 39I, to control processor, 39J, as fast as control processor, 39J, is prepared to receive said information.

Having been decrypted, said information is identical to the binary

information of the first message of example #3 (except that the meter-monitor information contains the aforementioned meter instruction information that is not in example #3 and the information of the meter-monitor format field reflects the presence of said instruction information). Accordingly, receiving the decrypted information of the first 0 25 message of example #4 from EOFS valve, 39H, causes control processor, 39J, to function, at the aforementioned secondary control level, in fashions that are identical (except as concerns the processing of the meter-monitor information) to the fashions invoked, at the primary control level, by receiving the information of the first message of example #3 from EOFS valve, 39F.

When EOFS valve, 39H, commences transferring the decrypted SPAM information of the first message of example #4, control processor, 39J, receives the smallest number of signal words that can contain H bits, records information said words in sequence at SPAM-input-signal memory, selects information of the first H bits at said memory, records said information at SPAM-header memory, and determines that the information at said memory does not match the aforementioned 11-header-invoking information.

Not resulting in a match causes control processor, 39J, automatically to compare the information at said SPAM-header memory with the aforementioned invoke-monitor-processing information, determine a match, and enter "0" at SPAM-Flag-monitor-info register memory.

Automatically, control processor, 39J, then receives additional SPAM signal words; records information of said words at said SPAM-input-signal memory in sequence immediately following the signal word information already recorded at said memory until the total quantity of SPAM signal words recorded at said memory is the smallest number of signal words that can contain H+X bits; selects information of the first X bits of information at said memory immediately after the first H bits, records said selected information at SPAM-exec memory, compares the information at said last named memory with controlled-function-invoking information, and determines a match with the aforementioned execute-at-205 information.

Said match causes control processor, 39J, to execute the aforementioned load-run-and-code instructions. Said instructions cause control processor, 39J, to determine that the information at said SPAM-Flag-at-secondary-level register memory is "0" which causes said processor, 39J, to place "0" at the aforementioned SPAM-Flag-secondary-level-2nd-step-incomplete register memory and, separately, at SPAM-Flag-secondary-level-3rd-step-incomplete register memory (rather than SPAM-Flag-primary-level-2nd-step-incomplete and SPAM-Flag-primary-level-3rd-step-incomplete memories) and to place information of a particular reentry-address at the aforementioned SPAM-address-of-next-instruction-upon-secondary-interrupt register memory (rather than SPAM-of-next-instruction-upon-primary-interrupt memory). Then said instructions cause control processor, 39J, to compare the information at said SPAM-header memory with header-identification information and determine a match with "01" information.

Said match causes control processor, 39J, to receive all remaining command information and padding bits in said first message in the fashion that applies to a SPAM message that contains meter-monitor information.

Automatically, control processor, 39J, receives and processes decrypted length token information. Automatically, control processor, 39J, receives and records additional SPAM signal words at said SPAM-input-signal memory until the quantity of SPAM words recorded at said memory is the smallest number of words that can contain H+X+L bits, selects information of the first L bits of information at said memory immediately after the first H+X bits, records said information at SPAM-length-info memory, determines that the information at said last named memory matches Z-token information, selects z-bits information associated with said Z-token information, records said z-bits information at said SPAM-length-info memory (thereby overwriting and obliterating the information previously at said memory), and processes the information at said memory as the numeric value of MMS-L. Automatically, control processor, 39J, adds H+X+L to the information of z-bits at said memory, divides the information of the resulting sum by the number of bits in one signal word, places a "0" at particular SPAM-Flag-working register memory if the information of the resulting quotient is a whole number or "1" at said SPAM-Flag-working memory if it is not. Automatically, control processor, 39J, determines a particular number of signal words to receive, commences receiving additional SPAM signal words, and records said words in sequence at said SPAM-input-signal memory immediately following the last SPAM signal word previously recorded at said memory until the total quantity of SPAM signal words recorded at said memory equals the number at said working register memory. Then, if the information at said SPAM-Flag-working register memory is "0", control processor, 39J, ceases accepting SPAM signal information. Or, if the information at said SPAM-Flag-working register memory is not "0", control processor, 39J, receives one additional signal word, compares the information of said word to information of one EOFS WORD, records said word at said SPAM-input-signal memory immediately following the last SPAM signal word recorded at said memory, receives one more SPAM signal word and records the information of said word at said SPAM-input-signal memory immediately following the last SPAM signal word recorded at said memory if said one additional signal word has matched said EOFS WORD information, and ceases accepting SPAM signal information.

When control processor, 39J, ceases accepting SPAM signal information, said load-run-and-code instructions cause control processor, 39J, to commence loading information at the main RAM of microcomputer, 205. Automatically, control processor, 39J, causes matrix switch, 39I, to cease transferring information from EOFS valve, 39H, to control processor, 39J, and commence transferring information from control processor, 39J, to the CPU of microcomputer, 205; instructs said CPU to commence receiving information from matrix switch, 39I, and loading said information at particular main RAM; and causes matrix switch, 39I, to cease transferring information from control processor, 39J, to said CPU and commence transferring information from EOFS valve, 39H, to said CPU. Automatically, microcomputer, 205, commences receiving the information, beginning with the first signal word at EOFS valve, 39H, which is the decrypted information of the first word of the program instruction set in said first message. Automatically, microcomputer, 205, loads the received information at particular main RAM in a fashion well known in the art.

Then said load-run-and-code instructions cause control processor, 39J, to execute the code portion of said instructions. In the same fashion that that applied in example #3, the instructions of said portion cause control processor, 39J, to determine that said first message contains

meter-monitor information, to locate the "program unit identification code" information in the information at said SPAM-input-signal memory, and to record information of said "code" information at SPAM-first-precondition register memory. Said instructions cause control processor, 39J, to select information of bits of the meter-monitor format field at at said SPAM-input-signal memory, to record said information at SPAM-mm-format memory, to compare the information at said memory with the aforementioned format-specification information, to determine a match with C-format information, and to execute particular preprogrammed process C-format instructions. Automatically, said last named instructions cause control processor, 39J, to place a particular C-offset-address number at SPAM-mm-format memory that identifies the address/location of the first bit of C format information. Then said instructions of the code portion cause control processor, 39J, to execute the aforementioned said locate-program-unit instructions; to select binary information of particular bit locations at said SPAM-input-signal memory, using the information of said C-offset-address number; and to place said selected information at said SPAM-first-precondition memory. Finally, said instructions of the code portion cause control processor, 39J, to determine, in a predetermined fashion, that control processor, 39J, is operating at secondary control level and place "1" at SPAM-Flag-secondary-level-3rd-step-incomplete register memory (rather than SPAM-Flag-primary-level-3rd-step-incomplete memory) signifying the completion of the code step executed by said load-run-and-code instructions.

Next said load-run-and-code instructions control processor, 39J, to determine that the information at said SPAM-Flag-at-secondary-level register memory is "0" which signifies that the run portion of said instructions remain uncompleted and which causes control processor, 39J, in a predetermined fashion, to commence waiting for interrupt information of the end of file signal from the EOFS valve that is inputting SPAM signal information to control processor, 39J, which is EOFS valve, 39H.

Whenever the control processor, 39J, of the station of FIG. 3 is instructed to commence waiting, the conventional instructions that control said processor, 39J, cause said processor, 39J, to execute particular steps before actually commencing to wait. Example #3 showed one such step: execution of particular collect-monitor-info instructions. In the preferred embodiment, said conventional instructions cause control processor, 39J, to execute particular primary-level-? instructions before executing said collect-monitor-info instructions. Said primary-level-? instructions cause control processor, 39J, to compare the information at the aforementioned SPAM-Flag-at-secondary-control-level memory with particular preprogrammed "0" information. A match results which means that control processor, 39J, has been instructed to wait at a secondary control level and instructions may exist at the primary control level that control processor, 39J, should execute before commencing to wait. Accordingly, said match causes control processor, 39J, to place information of a particular reentry-address at the aforementioned SPAM-next-secondary-instruction-address register memory which reentry-address is the location of the next instruction to be executed when the control of control processor, 39J, reverts from primary control level instructions to the secondary level instructions; to place "1" at the aforementioned SPAM-Flag-at-secondary-control-level memory signifying that control processor, 39J, is not operating at the secondary control level; and to commence executing control instructions beginning with that

instruction whose particular address/location is the address/location of the information at the aforementioned SPAM-next-primary-instruction-address memory.

Automatically, the particular ones of said decrypt-process-and-meter-current-01-or-11-header-message instructions that begin at said address/location cause control processor, 39J, to execute the meter portion of said instructions. Under control of the instructions of said portion, control processor, 39J, compares the information at the aforementioned SPAM-decryption-mark register memory to particular preprogrammed information of zero. No match results. Not resulting in a match signifies the presence of decryption mark information and causes control processor, 39J, under control said instructions, to cause matrix switch, 39I, to commence transferring information from control processor, 39J, to the buffer/comparator, 14, of signal processor, 200; then to transfer header information that identifies a transmission of meter information then the aforementioned decoder-203 source mark information then information of the decryption mark of key Z information recorded at SPAM-decryption-mark register memory then all of the received binary information of said first message that is recorded at said SPAM-input-signal memory; then to cause matrix switch, 39I, to cease transferring information from control processor, 39J, to said buffer/comparator, 14. (Said received information is complete information of the first combining synch command of example #4, and said information that is transmitted to buffer/comparator, 14, is called, hereinafter, the "1st meter-monitor information (#4).") Then the instructions of said portion cause control processor, 39J, to enter "1" at said SPAM-Flag-monitor-info memory because the information of said 1st meter-monitor information (#4) is monitor information as well as meter information, to enter "1" at the aforementioned SPAM-Flag-primary-level-3rd-step-incomplete register memory signifying the completion of the meter step executed by said decrypt-process-and-meter-current-01-or-11-header-message instructions, and to commence waiting for interrupt information of an end of file signal.

In due course, EOFS valve, 39F, receives the last signal word of the information segment of said first message, which is the last signal word of said program instruction set. Receiving said word causes EOFS valve, 39F, to transfer said word, via matrix switch, 39I, to decryptor, 39K, which causes decryptor, 39K, to decrypt the information of said word and transfer the decrypted information of said word, via buffer, 39G, to EOFS valve, 39H. If the decrypted information of said word contains MOVE bit information, receiving said information causes EOFS valve, 39H, to transfer said information, via matrix switch, 39I, to the CPU of microcomputer, 205, which causes microcomputer, 205, to load said information at particular main RAM.

Then said valve, 39F, commences receiving information of the eleven EOFS WORDs that constitute the end of file signal at the end of said first message.

Receiving the first EOFS WORD of said eleven causes EOFS valve, 39F, to cease transferring SPAM message information which causes decryptor, 39K, to cease decrypting and causes microcomputer, 205, to cease loading information at main RAM if the decrypted information of the last signal word of the information segment of said first message contains MOVE bit information (which MOVE bit information causes EOFS valve, 39H,

automatically to transfer inputted information of said word).

Subsequently, in the fashion described in the following twelve paragraphs, receiving the eleventh and last EOFS WORD of said end of file signal causes the apparatus of the subscriber station of FIG. 3 to load decrypted information of the last signal word of the information segment of said first message at main RAM if said decrypted information contains no MOVE bit information and cease loading; to terminate the process of decrypting at decryptor, 39K; to execute the program instruction set information loaded at said main RAM as a machine language program, thereby causing the events described in the thirteenth paragraph hereinafter (which begins, "As described in "One Combined Medium" above, running . . . "); and to commence waiting to receive from EOFS valve, 39F, the header information of a subsequent SPAM message.

Receiving the eleventh and last EOFS WORD of said end of file signal at EOFS valve, 39F, causes said valve, 39F, to transmit an interrupt signal of EOFS-signal-detected information to control processor, 39J, and to commence waiting for a control instruction from said processor, 39J.

Receiving said interrupt signal causes control processor, 39J, to determine, in a predetermined fashion, a match between information that identifies the EOFS valve that transmitted said signal and the aforementioned from-39F information at the aforementioned SPAM-primary-input-source register memory. Said match causes control processor, 39J, automatically to execute that particular portion of said decrypt-process-and-meter-current-01-or-11-header-message instructions that begins with the instruction that is located at the particular reentry-address of the reentry-address information at the aforementioned SPAM-address-of-next-instruction-upon-primary-interrupt register memory. Automatically, the instructions of said portion cause control processor, 39J, to transmit to controller, 20, of signal processor, 200, via control information transmission means, a particular preprogrammed first-EOFS-signal-detected interrupt signal then particular primary-end-of-file-signal-detected information and one instance of the aforementioned at-39J information. Receiving said interrupt signal of EOFS signal-detected information causes control processor, 39J, then to cause matrix switch, 39I, to cease transferring information from EOFS valve, 39F, to decryptor, 39K.

Receiving first-EOFS-signal-detected said interrupt signal and information causes controller, 20, to execute particular ones of the aforementioned decrypt-with-Z-at-39K and decrypt-a-01-or-11-header-message instructions. Automatically, said ones cause controller, 20, to transmit a particular interrogate-message-end instruction to decryptor, 39K. Said instruction causes decryptor, 39K, in a predetermined fashion and after transferring the aforementioned decrypted information of the last signal word of the information segment of said first message, to transmit particular decryption-complete information to controller, 20, which information includes particular last-word information that is the binary image of said decrypted information of the last signal word.

Receiving said decryption-complete information causes controller, 20, to execute particular preprogrammed end-01-or-11message-decryption instructions that cause controller, 20, to compare said last-word information to preprogrammed information of one EOFS WORD. Resulting in a match, under control of said instructions, causes controller, 20,

automatically to transmit a particular transmit-padding-bits instruction to decryptor, 39K, that decryptor, 39K, has capacity to respond to in a predetermined fashion, which instruction causes decryptor, 39K, to transfer one signal word of padding bits to buffer, 39G, causing said buffer, 39G, automatically to input said word of padding bits to EOFS valve, 39H. (If the decrypted information of the last signal word of the information segment of said first message contains no MOVE bit information--in other words, if said word is an EOFS WORD--receiving said information causes EOFS valve, 39H, to transfer previously inputted information of said last word, via matrix switch, 39I, to microcomputer, 205, which causes microcomputer, 205, to load said information at particular main RAM.) Then said end-01-or-11-message-decryption instructions cause controller, 20, to cause decryptor, 39K, to discard said key information of decryption key Z, to cease decrypting inputted information and to commence transferring all inputted information to buffer, 39G, without alteration. Next said instructions cause controller, 20, to transmit a particular preprogrammed transmit-EOF-Signal-and-continue instruction to control processor, 39J. In so doing, controller, 20, completes said end-01-or-11-message-decryption instructions, said decrypt-a-01or-11-header-message instructions and said decrypt-with-Z-at-39K instructions and commences processing in the conventional fashion.

Receiving said transmit-EOF-Signal-and-continue instruction causes control processor, 39J, in a predetermined fashion, to transmit the aforementioned transmit-and-wait instruction to EOFS valve, 39F, then to execute particular instructions of the process portion of said decrypt-process-and-meter-current-01-or-11-header-message instructions. Automatically said instructions cause control processor, 39J, to place "0" at the aforementioned SPAM-Flag-at-secondary-control-level memory signifying that control processor, 39J, is operating at the secondary control level and to commence executing control instructions beginning with that instruction whose particular address/location is the address/location of the information at the aforementioned SPAM-next-secondary-instruction-address memory. Automatically, control processor, 39J, executes particular instructions prior to commencing to wait, compares the information at SPAM-Flag-monitor-info memory with particular preprogrammed "0" information, and no match results. Not resulting in a match causes control processor, 39J, automatically to skip collect-monitor-info instructions and commence waiting for interrupt information of the end of file signal.

Receiving said transmit-and-wait instruction causes EOFS valve, 39F, to transfer sequentially eleven instances of EOFS WORD information--that is, one complete end of file signal--via switch, 39I, to decryptor, 39K; to set the information at the EOFS WORD Counter of said valve, 39F, to zero; to transmit the aforementioned complete-and-waiting information to said control processor, 39J, as an interrupt signal; and to commence waiting for a control instruction from control processor, 39J, before processing next inputted information.

Receiving said eleven instances of EOFS WORD information causes decryptor, 39K, to transfer said information, without alteration, via buffer, 39G, to EOFS valve, 39H.

Receiving said information--more precisely, receiving the eleventh instance of an EOFS WORD in said information--causes EOFS valve, 39H, to

transmit an interrupt signal of EOFS-signal-detected information to control processor, 39J, and to commence waiting for a control instruction from said processor, 39J.

Receiving said interrupt signal causes control processor, 39J, to determine, in a predetermined fashion, that the EOFS valve that transmitted said signal is the valve identified by the aforementioned from-39H information at the aforementioned SPAM-secondary-input-source memory. Said determining causes control processor, 39J, automatically to jump to and execute that particular portion of said load-run-and-code instructions that begins with the instruction that is located at the particular reentry-address of the reentry-address information at the aforementioned SPAM-address-of-next-instruction-upon-secondary-interrupt memory. Said particular portion is the run portion of said load-run-and-code instructions. Automatically, the instructions of said portion cause control processor, 39J, to cause matrix switch, 39I, to cease transferring information from EOFS valve, 39H, to the CPU of microcomputer, 205, and to commence transferring information from control processor, 39J, to said CPU; to transmit a control instruction to said CPU that causes microcomputer, 205, to cease loading information at said main RAM and execute the information so loaded as so-called "machine executable code" of one so-called "job"; to cause matrix switch, 39I, to cease transferring information from control processor, 39J, to said CPU; then to transmit the aforementioned discard-and-wait instruction, via control transmission means, to EOFS valve, 39H, (causing said valve, 39H, to set the information at said EOFS WORD Counter to "00000000", to transmit the aforementioned complete-and-waiting information to control processor, 39J, as a second interrupt signal, then to commence waiting for a further control instruction from control processor, 39J); and finally, to determine that the information at the aforementioned SPAM-Flag-at-secondary-control-level memory matches particular preprogrammed "0" information and, accordingly, to place "1" at the aforementioned SPAM-Flag-secondary-level-2nd-step-incomplete memory which information indicates that control processor, 39J, has completed the instructions of said run portion. In so doing, control processor, 39J, completes the instructions of said run portion.

Automatically said load-run-and-code instructions cause control processor, 39J, to compare the information at the aforementioned SPAM-Flag-secondary-level-3rd-step-incomplete memory with particular preprogrammed information that is "1". No match results which signifies that control processor, 39J, has already completed the code portion of said load-run-and-code instructions. Not resulting in a match causes control processor, 39J, to complete said load-run-and-code instructions, to place "1" at the aforementioned SPAM-Flag-secondary-level-incomplete register memory signifying completion of the secondary level control functions, to place "1" at the aforementioned SPAM-Flag-at-secondary-control-level register memory, and to commence executing control instructions beginning with that instruction whose particular address/location is the address/location of the information at the aforementioned SPAM-next-primary-instruction-address memory.

Automatically, the particular instructions that begin at said address/location cause control processor, 39J, to execute particular end-process-portion-? instructions of said decrypt-process-and-meter-current-01-or-11-header-message instructions. Under control of said end-process-portion-? instructions, control processor, 39J, determines

that the information at said SPAM-Flag-secondary-level-incomplete register memory matches a particular preprogrammed "1"; places "1" at the aforementioned SPAM-Flag-primary-level-2nd-step-incomplete register memory, signifying completion of the process portion of said decrypt-process-and-meter-current-01-or-11-header-message instructions; determines that the information at the aforementioned SPAM-Flag-primary-level-3rd-step-incomplete register memory matches a particular preprogrammed "1", signifying the completion of the meter portion of said decrypt-process-and-meter-current-01-or-11-header-message instructions; and completes execution of said decrypt-process-and-meter-current-01-or-11-header-message instructions.

Completing the controlled functions of said first message causes control processor, 39J, automatically to prepare to receive the next SPAM message. Automatically, control processor, 39J, compares the information at said SPAM-header memory to particular preprogrammed cause-retention-of-exec information that is "01". A match results which causes control processor, 39J, to compare the information at the aforementioned SPAM-Flag-executing-secondary-command register memory to particular preprogrammed information that is "0". A match results which signifies that control processor, 39J, is executing control functions invoked by information of a secondary level execution segment. Accordingly, said match causes control processor, 39J to place information of the information at said SPAM-exec memory at the aforementioned SPAM-last-secondary-01-header-exec register memory (rather than at SPAM-last-01-header-exec register memory). Being preprogrammed to collect monitor information, control processor, 39J, automatically compares the information at said SPAM-Flag-monitor-info memory with particular preprogrammed "0" information. No match results which indicates that control processor, 39J, has transferred monitor information in respect to said first message. Then, automatically, control processor, 39J, causes all apparatus of control processor, 39J, to delete from memory all information of said first message except information at said SPAM-first-precondition, SPAM-last-01-header-exec, and SPAM-last-secondary-01-header-exec memories. Finally, control processor, 39J, causes EOFS valves, 39F and 39H, to commence processing inputted signal words, in their preprogrammed detecting fashions, and outputting information to matrix switch, 39I; causes matrix switch, 39I, to commence transferring information from the EOFS valve identified by the information at the aforementioned SPAM-primary-input-source register memory, which is EOFS valve, 39F, to control processor, 39J; and commences waiting to receive information of a subsequent SPAM header from matrix switch, 39I.

As described in "One Combined Medium" above, running said program instruction set causes microcomputer, 205, (and URS microcomputers, 205, at other subscriber stations) to place appropriate FIG.. 1A image information at particular video RAM then to transfer particular-number-of-overlay-completed information and instructions to control processor, 39J. Receiving said information and instructions causes control processor, 39J, to place the number "00000001" at the aforementioned SPAM-second-precondition register memory, signifying that said image information represents the first overlay of its associated video program.

Receiving said 1st meter & monitor information (#4) causes buffer/comparator, 14, automatically to compare the information, in said 1st information, of the header information that identifies a transmission

of meter information to particular preprogrammed header-identification-@14 information. A match results with particular meter-identification information which causes buffer/comparator, 14, to to select information of particular predetermined bit locations (which locations contain the information of the meter instruction field of said 1st meter & monitor information (#4) and to compare said selected information to preprogrammed metering-instruction-comparison information. (Matches with particular metering-instruction-comparison information invoke simple metering processes that buffer/comparator, 14, has capacity to perform by itself). No match results (which signifies that the meter processing caused by the information said field is too complex to occur under control of buffer/comparator, 14, alone). Not resulting in a match causes buffer/comparator, 14, automatically to transmit to controller, 20, particular preprogrammed instruct-to-meter information then said selected information (which the meter instruction information of said first message).

Receiving said information causes controller, 20, to compare said meter instruction information to preprogrammed instruct-to-meter-@ 0 information and to determine that said information matches particular 1-2-3-meter information that invokes three particular sets of instructions preprogrammed at controller, 20. The first set initiates assembly at buffer/comparator, 14, of a first particular meter record that is based on the information, in one meter-monitor field of the first message, of the program unit information of said first command. Assembly of said record enables a particular remote metering station to account for the use of the information of said "Wall Street Week" program and bill subscribers who use said information. The second set causes assembly at buffer/comparator, 14, of a second particular meter record that is based on the information, in a second meter-monitor field, of the supplier of the program instruction set that follows said first command. The capacity for a given command to cause the assembly of more than one record enables separate ownership properties that are used jointly in a given instance of SPAM information to be accounted for separately. For example, the copyright owner of said "Wall Street Week" program (who owns the FIG. 1B image) and said supplier (whose information generates the FIG. 1A image) may be different parties. Said second record enables said remote station (or alternatively, a separate remote metering station) to account for use of said program set separately from the accounting of said "Wall Street Week" program and to charge subscribers separately. The third set causes the recording at recorder, 16, of said second meter record.

Said match causes controller, 20, to execute said instructions. Under control of said first set, controller, 20, initiates assembly of said first meter record by selecting and placing at particular record locations at buffer/comparator, 14, particular record format information, then program unit information from a particular meter-monitor field of said 1st meter & monitor information (#4), origin of transmission information from a second field, date and time of transmission information from a third field, decryption key information from the decryption mark of said 1st meter & monitor information (#4), and finally date and time of processing information from clock, 18.

In its preprogrammed fashion, when said first specified set is completed, controller, 20, executes said second specified set which causes controller, 20, to assemble said second record. Under control of

said second set, controller, 20, places at a particular second record locations at buffer/comparator, 14, particular record format information, then information of the supplier of said program instruction set from a particular meter-monitor field of 1st meter & monitor information (#4), program unit information from a second field, origin of transmission information from a third field, date and time of transmission information from a fourth field, and finally date and time of processing information from clock, 18.

When said second set is completed, controller, 20, executes said third specified set which causes controller, 20, to cause buffer/comparator, 14, to transfer said second meter record to recorder, 16, in a predetermined fashion then discard all information of said record from its memory and to cause recorder, 16, to process and record said transferred meter record in its preprogrammed fashion.

Buffer/comparator, 14, and controller, 20, are preprogrammed to process monitor information, and completing the metering functions invoked by said 1-2-3-meter information causes controller, 20, to cause buffer/comparator, 14, to execute its preprogrammed automatic monitoring functions. These functions proceed in the same fashion that applied to the 1st monitor information (#3). Buffer/comparator, 14, determines that the source mark of said 1st meter & monitor information (#4) matches source information associated with the monitor record of the prior programming displayed at monitor, 202M, but that the program unit information of said 1st meter & monitor information (#4) does not match the program unit information of said monitor record. Accordingly, buffer/comparator, 14, causes the apparatus of signal processor, 200, to record said monitor record at recorder, 16, and to replace said monitor record at buffer/comparator, 14, with a new monitor record based on the o information of the 1st meter & monitor information (#4). When buffer/comparator, 14, completes said monitoring functions, buffer/comparator, 14, deletes all unrecorded information of said 1st meter & monitor information (#4) and commences waiting for the next instance of inputted information.

The content of the 1st meter & monitor information (#4) causes controller, 20, to organize the information of said new monitor record in a particular fashion that differs, in one respect, from the new monitor record generated in the third example by the 1st monitor information (#3). Unlike the first combining synch command in the third example, the first combining synch command in the fourth example must be decrypted, and the 1st meter & monitor information (#4) includes a decryption mark. Thus the new monitor record generated by the 1st meter & monitor information (#4) includes decryption key information, not included in the new monitor record generated by the 1st monitor information (#3), and record format field information that reflects the presence of said decryption field information.

OPERATING S. P. SYSTEMS ... EXAMPLE #4 (SECOND MESSAGE)

With one exception, the information of the second message of example #4 is identical to the information of the second message of example #2. The meter instruction information the second message of example #4 instruct subscriber station apparatus to perform certain meter operations, described more fully below, that are not performed in example #2. In all other respects the second message of example #4 is identical to the

second message of example #2 and is encrypted, embedded, and transmitted at the "Wall Street Week" program originating studio just as in example #2.

But a significant difference exists between examples #2 and #4. Unlike example #2 wherein FIG. 1A image information exists at all URS microcomputers, 205, FIG. 1A image information exists in example #4 only at those subscriber stations where the encrypted information of the first message has been decrypted, causing the apparatus of said stations to load and execute program instruction set information at the microcomputers, 205. Only at said stations does "program unit identification code" information of said "Wall Street Week" program exist at the SPAM-first-precondition register memories of the control processors, 39J. Only at said subscriber stations can the second combining synch command cause the display of FIG. 1C information.

Receiving said second message causes the apparatus of the station of FIG. 3 (and other stations that are configured and preprogrammed like the station of FIG. 3), in the following fashion, to decrypt the encrypted portions of said message, to execute the controlled functions of the decrypted information of said message; and to record meter information and monitor information relating to said message. (Simultaneously, receiving said message causes other stations that are configured and/or preprogrammed differently from the station of FIG. 3 to respond, automatically, in fashions that differ from the fashion of the station of FIG. 3 in ways that are described below parenthetically.)

When divider, 4, commences transferring the embedded information of said second message to decoder, 203, the binary SPAM information of said message is received at decoder, 203; detected at detector, 34; checked and corrected, as necessary, at processor, 39B; converted into locally usable binary information at processor, 39D; and processed for end of file signal information at EOFS valve, 39F. Receiving the SPAM message information of said message causes EOFS valve, 39F, to transfer said information, via matrix switch, 39I, to control processor, 39J, as fast as control processor, 39J, is prepared to receive said information.

Receiving said information causes control processor, 39J, to record the smallest number of signal words that can contain H bits at SPAM-input-signal memory; to select information of the first H bits at said memory; to record said information at SPAM-header memory; to compare the information at said SPAM-header memory with the aforementioned invoke-monitor-processing information, determine a match with particular preprogrammed "00"information, and enter "0" at the aforementioned SPAM-Flag-monitor-info register memory; to record additional SPAM signal words at said SPAM-input-signal memory until the total quantity of SPAM signal words recorded at said memory equals the smallest number of signal words that can contain H+X bits; to record information of the first X bits of information at said SPAM-input-signal memory immediately after the first H bits at said SPAM-exec memory; to compare the information at said memory with the aforementioned controlled-function-invoking information and determine a match with particular preprogrammed this-message-addressed-to-200 information; and to execute the aforementioned transfer-header-and-exec-seg-info-to-200 instructions.

Executing said instructions causes control processor, 39J, to transfer to controller, 20, of signal processor, 200, via control information

transmission means, an interrupt signal, the aforementioned process-this-message information and at-39J information, and information of the header and execution segment of said second message.

Receiving said interrupt signal and information causes controller, 20, in a predetermined fashion, to cease a processing task that is unrelated to the processing of said second message; to compare said information of the execution segment to the aforementioned controlled-function-invoking-@ information and determine a match with particular decrypt-with-key-J information; to execute particular preprogrammed decrypt-with-J-at-39K instructions; to select and transfer key information of J to decryptor, 39K; to compare said information of the header to the aforementioned header-identification-@200 information and determine a match with particular "00" header information; to execute particular preprogrammed decrypt-a-00-header-message-at-39K instructions; to transmit a particular preprogrammed process-and-transmit-info-of-MMS-L instruction, via control transmission means, to control processor, 39J; then, in a predetermined fashion, to commence an unrelated processing task.

Receiving said last named instruction causes control processor, 39J, to execute particular preprogrammed process-length-token-and-transmit-MMS-L instructions; to record additional SPAM signal words at said SPAM-input-signal memory until the quantity of SPAM words recorded at said memory is the smallest number of words that can contain H+X+L bits; to select information of the first L bits at said memory immediately after the first H+ X bits; to determine that said information matches Y-token information; to select y-bits information associated with said Y-token information and record said y-bits information at said SPAM-length-info memory (thereby placing at said memory information of the number of encrypted meter-monitor segment bits in said second message after the last bit of length token--that is, the numeric value of MMS-L); and to transmit to controller, 20, via control transmission means, an interrupt signal, the aforementioned at-39J information, information of said numeric value of MMS-L.

Receiving said interrupt signal, at-39J information, information of MMS-L causes controller, 20, in the aforementioned predetermined fashion, to cease an unrelated processing task; to execute, in a predetermined fashion, particular preprogrammed ones of the aforementioned decrypt-a-00-header-message-at-39K instructions; to transmit to decryptor, 39K, particular decrypt-a-00-header-message instructions (which instructions include information of MMSL-L); to transmit to control processor, 39J, a particular decrypt-process-and-meter-a-00-message instruction and particular decryption mark information of key J; then, in a predetermined fashion, to commence an unrelated processing task.

Receiving said last named instruction and mark information causes control processor, 39J, to record said mark information at the aforementioned SPAM-decryption-mark register memory; to enter "1" at the aforementioned SPAM-Flag-monitor-info register memory; to place particular from 39F information at the aforementioned SPAM-primary-input-source register memory; and to execute particular preprogrammed decrypt-process-and-meter-current-00-header-message instructions.

Executing said instructions causes control processor, 39J, first, to

receive all remaining command information and padding bits in said second message in the following fashion. Said instructions cause control processor, 39J, to add H+X+L to the information of y-bits at the aforementioned SPAM-length-info memory; to determine a particular number of signal words to receive from EOFS valve, 39F; to receive and record said words at said SPAM-input-signal memory immediately following SPAM signal word previously recorded at said memory; if the command information of said message fills a whole number of signal words, to receive one additional signal word, compare the information of said word to information of one EOFS WORD, record said word at said SPAM-input-signal memory immediately following the last SPAM signal word recorded at said memory, and receive and record the information of one more SPAM signal word at said SPAM-input-signal memory immediately following the last SPAM signal word recorded at said memory if said one additional signal word has matched said EOFS WORD information; and to cease accepting SPAM signal information from EOFS valve, 39F.

Executing said decrypt-process-and-meter-current-00-header-message instructions causes control processor, 39J, then, to transfer to decryptor, 39K, the SPAM information of said second message in the following fashion. Said instructions cause control processor, 39J, to cause matrix switch, 39I, to cease transferring information from EOFS valve, 39F, to control processor, 39J, and commence transferring information from control processor, 39J, to decryptor, 39K, and cause control processor, 39J, to transfer all information recorded at said SPAM-input-signal memory of control processor, 39J, which information is complete information of said second message.

Automatically, decryptor, 39K, commences receiving SPAM signal information.

Executing said decrypt-process-and-meter-current-00-header-message instructions causes control processor, 39J, then, in the following fashion, to prepare to receive the decrypted information of said second message and to execute, at a secondary control level under primary control of said decrypt-process-and-meter-current-00-header-message instructions, the controlled functions invoked by said decrypted information. Said instructions cause control processor, 39J, to place information of a particular reentry-address at the aforementioned SPAM-next-primary-instruction-address register memory; to place information of "0" at the aforementioned SPAM-Flag-primary-level-21nd-step-incomplete register memory and, separately, at SPAM-Flag-primary-level-3rd-step-incomplete register memory; to place information of "0" at the aforementioned SPAM-Flag-secondary-level-incomplete register memory; to compare the information at said SPAM-Flag-monitor-info memory with particular preprogrammed "0" information and skip all steps of collecting monitor information because no match results; to cause all apparatus of control processor, 39J, to delete from memory all information of said second message except information at said SPAM-decryption-mark, SPAM-Flag-at-secondary-control-level, SPAM-primary-input-source, SPAM-next-primary-instruction-address register memories; to cause matrix switch, 39I, to cease transferring SPAM message information from control processor, 39J, to decryptor, 39K, and commence transferring SPAM message information from EOFS valve, 39H, to control processor, 39J; to place information of "0" at the aforementioned SPAM-Flag-executing-secondary-command register memory; to place information of "0" at the aforementioned SPAM-Flag-at-secondary-level register memory; and to

commence waiting to receive information of a subsequent SPAM header from said switch, 39I.

Receiving from controller, 20, the aforementioned key information of J and decrypt-a-00-header-message instructions (that include information of MMS-L) and from matrix switch, 39I, the aforementioned transferred SPAM message information that is complete information of said second message causes decryptor, 39K, to transfer the first H bits of said SPAM information to buffer, 39G, without decrypting or altering said bits in any fashion; to decrypt and transfer the next X bits of said information; to transfer the next L bits without decrypting or altering said bits; to decrypt and transfer the next MMS-L bits; and finally, to transfer any bits remaining after the last of said MMS-L bits without decrypting or altering said bits remaining. In so doing, decryptor, 39K, inputs complete unencrypted information of said second message to buffer, 39G. Said complete unencrypted information is identical to the SPAM message information that decryptor, 10, inputs to controller, 12, in example #2.

Receiving said complete unencrypted information causes buffer, 39G, automatically to buffer said information and input said information to EOFS valve, 39H, and causes EOFS valve, 39H, to transfer said information, via matrix switch, 39I, to control processor, 39J, as fast as control processor, 39J, is prepared to receive said information.

Receiving said information causes control processor, 39J, to record the smallest number of signal words that can contain H bits at SPAM-input-signal memory; to select information of the first H bits at said memory; to record said information at SPAM-header memory; to compare the information at said SPAM-header memory with the aforementioned invoke-monitor-processing information, determine a match with particular preprogrammed "00" information, and enter "0" at the aforementioned SPAM-Flag-monitor-info register memory; to record additional SPAM signal words at said SPAM-input-signal memory until the total quantity of SPAM signal words recorded at said memory equals the smallest number of signal words that can contain H+X+L bits; to record information of the first X bits of information at said SPAM-input-signal memory immediately after the first H bits at said SPAM-exec memory; to compare the information at said memory with the aforementioned controlled-function-invoking information and determine a match with the aforementioned execute-conditional-overlay-at-205 information; and to execute the aforementioned conditional-overlay-at-205 instructions.

Executing said instructions causes control processor, 39J, first, to receive all remaining command information and padding bits in said second message in the following fashion. Said instructions cause control processor, 39J, to record additional SPAM signal words at said SPAM-input-signal memory until the quantity of SPAM words recorded at said memory is the smallest number of words that can contain H+X+L bits; to select information of the first L bits at said memory immediately after the first H+X bits; to determine that said information matches Y-token information; to select y-bits information that is information of the numeric value of MMS-L and record said information at said SPAM-length-info memory; add H+X+L to the information said memory; to determine a particular number of signal words to receive from EOFS valve, 39H; to receive and record said words at said SPAM-input-signal memory immediately following SPAM signal word previously recorded at said memory; if the command information of said message fills a whole number

of signal words, to receive one additional signal word, compare the information of said word to information of one EOFS WORD, record said word at said SPAM-input-signal memory immediately following the last SPAM signal word recorded at said memory, and receive and record the information of one more SPAM signal word at said SPAM-input-signal memory immediately following the last SPAM signal word recorded at said memory if said one additional signal word has matched said EOFS WORD information; and to cease accepting SPAM signal information.

By receiving all command information and padding bits in said second message, control processor, 39J, receives all of the unencrypted complete information of said second message. Accordingly, the next signal word to be transferred by said valve, 39H, will be the first word of a subsequent message inputted to buffer, 39G.

Executing said conditional-overlay-at-205 instructions causes control processor, 39J, then, in the following fashion, to locate information of the the unique "program unit identification code" that identifies the program unit of said "Wall Street Week" program and determine that said information matches the information at the aforementioned SPAM-first-precondition register memory. Said instructions cause control processor, 39J, to select information of the bits of the meter-monitor format field in said first message; to compare said information with format-specification information; to determine a match with particular D-format information; to place at the aforementioned SPAM-mm-format memory a particular D-offset-address number that is different from the aforementioned A-, B-, and C-offset-address numbers; to execute the aforementioned locate-program-unit instructions and locate the program unit field in the meter-monitor information of said second message in the fashion described above; to select binary information of a particular number of contiguous bit locations at said SPAM-input-signal memory that begin at a particular number of bit locations after the first bit location at said memory (which binary information is said information of the the unique "program unit identification code"); and to compare said binary information to the information at the aforementioned SPAM-first-precondition register memory, causing a match to result.

(At those subscriber stations where the information of the program unit field in the meter-monitor information of said second message fails to match information at SPAM-first-precondition register memory--including all stations that are preprogrammed with decryption key information of J but not with decryption key information of Z--particular first-condition-test-failed instructions of said conditional-overlay-at-205 instructions cause the control processors, 39J, of said stations to enter "0" at each of the aforementioned SPAM-Flag-first-condition-failed and SPAM-Flag-do-not-meter register memories, which memories are each normally "1"; to cause all SPAM information at the main and video RAMs of the microcomputers, 205, of said stations to be cleared; and to complete all conditional-overlay-at-205 instructions and, in so doing, to complete all controlled functions invoked by said second message at the secondary control level.)

So resulting in a match, under control of the conditional-overlay-at-205 instructions at the station of FIG. 3, causes control processor, 39J, then, to execute the aforementioned locate-overlay-number instructions and locate the overlay number field in the meter-monitor information of said second message in the fashion described above; to select binary

information of a particular number of contiguous bit locations at said SPAM-input-signal memory that begin at a particular number of bit locations after the first bit location at said memory (which binary information is the information of said overlay number field); and to compare said binary information to the information at the aforementioned SPAM-second-precondition register memory, causing a match to result.

(At those subscriber stations where the information of the overlay number fails to match information at SPAM-second-precondition memory, particular second-condition-test-failed instructions of said conditional-overlay-at-205 instructions cause the control processors, 39J, of said stations to interrupt the operation of the CPUs of the microcomputers, 205, of said stations; to cause said microcomputers, 205, to restore efficient operation in a fashion described more fully below; to enter "0" at the aforementioned SPAM-Flag-second-condition-failed register memory, which memories is normally "1"; and to complete all conditional-overlay-at-205 instructions and controlled functions invoked by said second message at the secondary control level.)

So resulting in a match, under control of said conditional-overlay-at-205 instructions at the station of FIG. 3, causes control processor, 39J, (and control processors, 39J, at other subscriber stations where matches with information at SPAM-second-precondition memory result) to cause matrix switch, 39I, to cease transferring information from EOFS valve, 39H, to control processor, 39J, and commence transferring information from control processor, 39J, to the PC-MicroKey System of microcomputer, 205; to transmit the instruction, "GRAPHICS ON", to said PC-MicroKey System; to cause matrix switch, 39I, to cease transferring information from control processor, 39J, to said PC-MicroKey System; and to complete all conditional-overlay-at-205 instructions and controlled functions invoked by said second message at the secondary control level.

Transmitting the instruction, "GRAPHICS ON", to the PC-MicroKey System of the subscriber station of FIG. 3 (and transmitting "GRAPHICS ON" to other PC-MicroKey Systems at other subscriber stations where the program instruction set of the first message has been run at a microcomputer, 205, and where said second message causes "GRAPHICS ON" to be transmitted) causes said PC-MicroKey System to combine the programming of FIG. 1A and of FIG. 1B and transmit the combined programming to monitor, 202M, where FIG. 1C is displayed.

Completing all conditional-overlay-at-205 instructions and controlled functions invoked at the secondary control level causes control processor, 39J, (and causes control processors, 39J, at other stations) to execute conventional control-function-complete instructions and compare the information at the aforementioned SPAM-Flag-at-secondary-control-level memory to particular "0" information. A match results.

Resulting in a match, under control of said instructions causes control processor, 39J, to place "1" at the aforementioned SPAM-Flag-secondary-level-incomplete memory, to place "1" at said SPAM-Flag-at-secondary-control-level memory, and to commence executing control instructions beginning with that instruction whose particular address/location is the address/location of the information at the aforementioned SPAM-next-primary-instruction-address memory.

Automatically, the particular instructions that begin at said

address/location cause control processor, 39J, to execute the particular end-process-portion-? instructions of said decrypt-process-and-meter-current-00-header-message instructions. Under control of said end-process-portion-? instructions, control processor, 39J, determines that the information at said SPAM-Flag-secondary-level-incomplete memory matches a particular preprogrammed "1"; places "1" at the aforementioned SPAM-Flag-primary-level-2nd-step-incomplete register memory; determines that a comparison of the information at the aforementioned SPAM-Flag-primary-level-3rd-step-incomplete register memory with a particular preprogrammed "1" does not result in a match, signifying that the meter portion of said decrypt-process-and-meter-current-00-header-message instructions remains uncompleted.

Not resulting in a match causes control processor, 39J, under control of said decrypt-process-and-meter-current-00-header-message instructions, to execute the meter portion of said instructions. Under control of the instructions of said portion, control processor, 39J, compares the information at the aforementioned SPAM-Flag-do-not-meter register memory to particular preprogrammed information of "0". No match results.

(At those subscriber stations where the aforementioned first-condition-test-failed instructions caused "0" to be entered at the SPAM-Flag-do-not-meter memories of said stations, matches result when the information at said memories is compared to "0". Said matches cause the control processors, 39J, of said stations to complete the decrypt-process-and-meter-current-00-header-message instructions of said stations and all controlled functions invoked by said second message immediately, without transferring any meter information to the buffer/comparators, 14, of said stations and, at particular selected ones of said stations, without entering "1" at the SPAM-Flag-monitor-info memories. Said selected stations are stations that are preprogrammed to collect monitor information.)

Not resulting in a match, under control said meter portion at the station of FIG. 3, causes control processor, 39J, to compare the information at the aforementioned SPAM-Flag-second-condition-failed register memory to particular preprogrammed information of "1". A match results.

(At such other stations where no matches result, not resulting in a match, under control of said instructions, causes the control processor, 39J, of each one of said other stations, to execute particular second-precondition-failed-meter instructions of said meter portion. Automatically, said instructions cause control processor, 39J, to transfer to the buffer/comparator, 14, of said one, particular header information that identifies a transmission of meter information at a station where inefficient operation of a microcomputer, 205, prevented combining; then the decoder-203 source mark of the decoder, 203, of said station; then information of the decryption mark of key J information recorded at SPAM-decryption-mark register memory of said station; then all of the received binary information of said second message that is recorded at said SPAM-input-signal memory of said station. Said transmitted information is called, hereinafter, the "2nd meter-monitor information---second precondition failed--(#4)." Then said instructions cause control processor, 39J, to place "1" at said SPAM-Flag-second-condition-failed memory and continue the regular instructions of said portion.)

Resulting in a match, under control said meter portion at the station of FIG. 3, causes control processor, 39J, to cause matrix switch, 39I, to commence transferring information from control processor, 39J, to buffer/comparator, 14, of signal processor, 200; to transfer the aforementioned header information that identifies a conventional transmission of meter information then the aforementioned decoder-203 source mark then information of the information recorded at said SPAM-decryption-mark register memory, which is the decryption mark of key J, then all of the received binary information of said second message that is recorded at said SPAM-input-signal memory; then to cause matrix switch, 39I, to cease transferring information from control processor, 39J, to said buffer/comparator, 14. (Said received information is complete information of the second combining synch command of example #4, and said information that is transmitted to buffer/comparator, 14, is called, hereinafter, the "2nd meter-monitor information (#4).") Then the instructions of said portion cause control processor, 39J, to enter "1" at said SPAM-Flag-monitor-info memory; to enter "1" at the aforementioned SPAM-Flag-primary-level-3rd-step-incomplete register memory; and to determine that a comparison of the information at the aforementioned SPAM-Flag-primary-level-2nd-step-incomplete register memory with a particular preprogrammed "1" results in a match, signifying the completion of the process portion of said decrypt-process-and-meter-current-00-header-message instructions.

Resulting in a match causes control processor, 39J, to complete said decrypt-process-and-meter-current-00-header-message instructions and all controlled functions of said second message.

Completing the controlled functions of said second message causes control processor, 39J, automatically to prepare to receive the next SPAM message. Automatically, control processor, 39J, compares the information at said SPAM-header memory to particular preprogrammed cause-retention-of-exec information that is "01". No match results. Not resulting in a match causes control processor, 39J, to execute particular collect monitor information and to compare the information at said SPAM-Flag-monitor-info memory with particular preprogrammed "0" information. No match results.

(By contrast, matches result at every station that is preprogrammed to collect monitor information where said second message is decrypted but FIG. 1C image information is not displayed because the "program unit identification code" information in said second message fails to match information at SPAM-first-precondition register memory. Said matches cause the control processors, 39J, of said stations to execute the aforementioned collect-monitor-information instructions. Said instructions cause said control processors, 39J, to transfer to the buffer/comparators, 14, particular header information that identifies a transmission of monitor information at a station where no combining occurred because first precondition program unit information failed to match and which transmission contains decryption mark information, then to transfer the aforementioned decoder-203 source mark information, then information of the decryption mark of key J information recorded at SPAM-decryption-mark register memory, then all of the received binary information of said second message that is recorded at the SPAM-input-signal memories of said stations. Said information that is transmitted to said buffer/comparators, 14, is called, hereinafter, the

"2nd monitor information (#4)." Then said instructions cause said control processors, 9J, to place "1" at said SPAM-Flag-monitor-info memory, at the aforementioned SPAM-Flag-first-condition-failed memory, and at the aforementioned SPAM-Flag-do-not-meter memory and to continue executing conventional control instructions. Then the conventional control instructions of said stations cause said control processors, 39J, to cause all apparatus of the controllers, 39, to delete from memory all information of said second message and to commence waiting to receive information of a subsequent SPAM header from the matrix switches, 39I.)

Not resulting in a match, at the station of FIG. 3, causes control processor, 39J, to cause all apparatus of controller, 39, to delete from memory all information of said second message; to cause matrix switch, 39I, to commence transferring information from the EOFS valve identified by the information at the aforementioned SPAM-primary-input-source register memory, which is EOFS valve, 39F, to control processor, 39J; and to commence waiting to receive information of a subsequent SPAM header from matrix switch, 39I.

Receiving said 2nd meter & monitor information (#4) causes buffer/comparator, 14, automatically to compare the header information that identifies a transmission of meter information to particular preprogrammed header-identification-@14 information. A match results with the aforementioned meter-identification information, causing buffer/comparator, 14, to select the meter instruction information of the aforementioned particular bit locations of the meter instruction field of said 2nd meter & monitor information (#4) and to compare said selected information to the aforementioned metering-instruction-comparison information. No match results, causing buffer/comparator, 14, automatically to transmit to controller, 20, the aforementioned instruct-to-meter information then said meter instruction information.

Receiving said information causes: controller, 20, to compare said meter instruction information to the aforementioned instruct-to-meter-@20 information and to determine that said meter instruction information matches particular preprogrammed update-program-record-&-increment-by-one information that causes controller, 20, to execute particular update-and-increment instructions. Said instructions cause signal processor, 200, not only to add one incrementally to each meter record maintained at buffer/comparator, 14, that is associated with decryption key information of the instance of meter information being processed (which is, substantively, the metering function invoked by the 2nd meter information (#2) but also to modify the information of the aforementioned first particular meter record, initiated by the 1st meter & monitor information

(#4). (The particular metering function invoked by said 2nd meter information (#2) could not modify any of the information of said first particular meter record, even by incrementing by one, because no information of decryption key J is associated with said record when the 2nd meter & monitor information (#4) is received at buffer/comparator, 14.)

Executing said update-and-increment instructions causes controller, 20, in a predetermined fashion, to analyze the information of said 2nd meter & monitor information (#4); to place information of the information of the overlay number field in said 2nd information at a particular record

field associated with said first particular meter record, signifying the combining of said overlay at the subscriber station of FIG. 3; and to place, at the particular record location occupied by record format information, particular new record format information that identifies the new format of said first particular meter record; to compare the decryption mark information in said 2nd meter & monitor information (#4) with the aforementioned decryption-key-comparison information, preprogrammed at buffer/comparator, 14; to determine several matches; to increment by one the meter record, at buffer/comparator, 14, associated with each particular decryption-key-comparison datum that matches the decryption mark of said 2nd meter & monitor information (#4); to discard all information of said 2nd meter & monitor information (#4) from its memory; and to complete said update-and-increment instructions.

Completing the metering functions invoked by said meter instruction information causes controller, 20, to cause buffer/comparator, 14, to execute its preprogrammed automatic monitoring functions. These functions proceed in the fashion that applied to the 2nd monitor information (#3).

The content of the 2nd meter & monitor information (#4) causes onboard controller, 14A, to organize the information of said new monitor record in a particular fashion that differs, in one respect, from the new monitor record generated in the third example by the 2nd monitor information (#3). The 2nd meter & monitor information (#4) includes a decryption mark. The presence of said mark causes causes onboard controller, 14A, to includes decryption key information of J, not included in the new monitor record generated by the 1st monitor information (#3), and record format field information that reflects the presence of said decryption field information.

(At each station where the aforementioned 2nd meter & monitor information--second precondition failed--(#4) is transmitted, receiving said 2nd information--failed--(#4) causes the buffer/comparator, 14, of said station automatically to compare the information, in said 2nd information--failed--(#4), of the header that identifies a transmission of meter information at a station where inefficient operation of a microcomputer, 205, prevented combining to the aforementioned header-identification-@14 information. A match results with particular second-precondition-failed information, causing buffer/comparator, 14, to select information of the aforementioned particular bit locations that contain the information of the meter instruction field of said 2nd information--failed--(#4) then automatically to transmit to controller, 20, a particular preprogrammed instruct-to-process-info-failed information then said selected information, which is the meter instruction information of said second message. Receiving said information causes controller, 20, in a predetermined fashion, to execute particular preprogrammed increment-by-one-&-record-failed-combining-info information that invokes to particular sets of instructions preprogrammed at controller, 20. The first set causes controller, 20, to cause buffer/comparator, 14, to add one incrementally to each meter record maintained at buffer/comparator, 14, that is associated with decryption key information that matches the decryption mark of said 2nd information--failed--(#4) in the fashion of example #2. Then the second set causes controller, 20, to assemble a record of a failed combining at buffer/comparator, 14; to record said record at recorder, 16, in the fashion of the second and third sets of example #4 (first message); and to complete the metering functions invoked by said increment-by-one-&-

record-failed-combining-info information. The content of said record includes information that identifies said record as information of a combining aborted due to inefficient operation of a subscriber station microcomputer, 205; the unique digital code information capable of identifying the subscriber station of FIG. 3 uniquely, which information is preprogrammed at controller, 20; and the "program unit identification code" and overlay number information of the meter-monitor segment information of said second message in said 2nd information--failed--(#4). At each station that processes said 2nd information--failed--(#4) and that is preprogrammed to collect monitor information, completing said metering functions causes the controller, 20, of said station to cause the buffer/comparator, 14, to execute its preprogrammed automatic monitoring functions. These functions proceed in the fashion that applied to the 2nd meter & monitor information (#4) with particular exceptions. Receiving said 2nd information--failed--(#4) causes the onboard controller, 14A, to add not only decryption key information but also information that combining failed to occur because of inefficient microcomputer operation and that the combining is of the overlay number of the information of the overlay number field in said 2nd information--failed--(#4).)

(At each station where the aforementioned 2nd monitor information (#4) is transmitted, no 1st meter & monitor information (#4) transmission occurred; onboard controller, 14A, has not initiated a new monitor record of the "Wall Street Week" program; and the aforementioned record of the prior programming displayed at monitor, 202M, remains at buffer/comparator, 14. Accordingly, receiving said 2nd monitor information (#4) causes the buffer/comparator, 14, of said station to process information in the fashion of the 1st monitor information (#3). Automatically, said buffer/comparator, 14, determines that the header information in said 2nd monitor information (#4) matches particular preprogrammed monitored-instruction-not-fulfilled information which causes buffer/comparator, 14, to input said 2nd monitor information (#4) to onboard controller, 14A. Receiving said 2nd monitor information (#4) causes onboard controller, 14A, to execute the aforementioned process-monitor-info instructions; to determine that the "program unit identification code" in said 2nd monitor information (#4) does not match the "program unit identification code" information in said record of prior programming; to cause signal processor, 200, to record said said record of prior programming at recorder, 16; to initiate a new monitor record that reflects the new "Wall Street Week" programming; and finally, to discard all unrecorded information of said 2nd monitor information (#4) and commence waiting for the next inputted instance of monitor information. The header information of the 2nd monitor information (#4) causes signal processor, 200, to assemble said new monitor record in the particular format of a combined video/computer medium transmission at a station where no combining occurred because first precondition program unit information failed to match and to include a particular record format field within said format identifying the format of said record. From the meter-monitor segment of said 2nd monitor information (#4), onboard controller, 14A, selects and records at particular signal record field locations the "program unit identification code" of the "Wall Street Week" program, the overlay number information, and minute of the "Wall Street Week" program transmission within a one month period. And onboard controller, 14A, records in a particular monitor record field location the aforementioned display unit identification code that identifies monitor, 202M, as the display apparatus of said new monitor

record and date and time information received from clock, 18.)

Operating S. P. Systems . . . Example #4 (Third Message)

Subsequently, the embedded information of the third message of the "Wall Street Week" program is inputted to decoder, 203. Said information is identical to the embedded information of the third message of examples #1, #2, and #3 and causes the same processing at decoder, 203, that the information of the third message of example #3 caused. The information of the third message of example #4 causes "GRAPHICS OFF" to be executed at the PC-MicroKey System of the microcomputers, 205, of all subscriber stations tuned to the "Wall Street Week" transmission. But like the third message of example #2, the third message of example #4 causes combining actually to cease only each selected one of said stations where information of the second message previously caused combining to commence.

However, example #4 does differ from example #2. In example #2, the second message causes combining to commence at every selected station where the information of said second message is decrypted; that is, every station preprogrammed with information of decryption key J. But the second message of example #4 causes combining to commence only at those selected stations where information not only of said second message is decrypted but also where information of the first message of example #4 had been decrypted; that is, only at those stations preprogrammed not only with information of decryption key J but also information of decryption key Z.

Thus example #4 illustrates a case where not only does selective processing of the second message enable the third message to have effect only at selected stations without any selective processing of said third message, the selective processing of the first message enables the third message to have effect only at an even more selective group of stations than would otherwise be the case. Placing the PC-MicroKey Systems of all stations into the "Graphics Off" mode prior to transmitting the first message of example #4 enables the third message of example #4 in the simplest possible fashion to cause combining to cease only at those stations that are preprogrammed with decryption key information not only of J but also of Z, with all the benefits outlined at the end of example #2.

Placing particular so-called "soft switches," one of which exists at each subscriber station, all into one given original position, "off" or "on", then transmitting a command that is processed selectively at selected stations and places said switches at said stations into the opposite position, "on" of "off", makes it possible to transmit a subsequent command that returns said switches at said selected stations (and only said switches) to said original position without any additional selective processing.

Significant advantages of simplicity and speed are achieved by devising signal processing apparatus and methods that minimize the need for selective processing. With regard to said third combining synch command, for example, no step of decrypting is required to affect only those stations that are preprogrammed with decryption key J. Accordingly, no possibility exists that an error in decrypting may occur at one or more of said stations, causing the combining of video RAM information and

received video information, at said one or more, not to cease at the proper time and to continue beyond said time (until such time as some subsequent command may execute "GRAPHICS OFF" or clear information from said video RAM at said stations). Because no time is required for decrypting, no possibility exists that some station may take longer (or shorter) than proper to perform decrypting causing the image of FIG. 1A to be displayed at some monitor, 202M, longer (or shorter) than proper. Perhaps most important, because no time is required for selective processing of said third command, the time interval that separates the time of embedding said third command at said remote station that originates the "Wall Street Week" program and the time of ceasing caused by said command at URS microcomputers, 205, can be the shortest possible interval. Making it possible for said time interval to be the shortest possible interval minimizes the chance that an error may occur in the timing of the embedding of said third command at said remote station causing all URS microcomputers, 205, to cease combining at a time that is other than the proper time.

Operating Signal Processor Systems . . . Example #5

Example #5 focuses on program unit identification signals detected at decoders, 30 and 40, of signal processor, 200.

Signal processor, 200, is preprogrammed with information that identifies each cable and over-the-air (hereinafter, "wireless") transmission or frequency in the locality of the subscriber station of FIG. 3 as well as the standard broadcast and cablecast practices that apply on said transmissions and frequencies. Via a conventional multi-channel cable transmission, in a fashion well known in the art, four channels of conventional television programming and two conventional FM radio signals are inputted to a first alternate contact of switch, 1, and to mixer, 2. Said television channels are transmitted normally assigned to channels 2, 4, 7, and 13 of the television frequency spectrum. Said radio signals are transmitted on 99.0 MHz and 100.0 MHz of the FM frequency spectrum. Via a conventional television receiving antenna, three conventional wireless television transmissions are inputted to the second alternate contact of switch, 1. Said wireless transmissions are on the frequencies of the television spectrum normally assigned to channels 5, 9, and 13. In a predetermined fashion, controller, 20, controls oscillator, 6, to sequence local oscillator, 6, in the pattern: cable channel 2, cable channel 4, cable channel 7, cable channel 13, wireless channel 5, wireless channel 9, wireless channel 13, then to repeat said pattern.

In example #5, the "Wall Street Week" combining synch commands are transmitted unencrypted as in the first example, and the "Wall Street Week" program is transmitted on the frequency of channel 13 by a wireless broadcast station whose transmission is retransmitted on the frequency of channel 13 on said cable. Thus a viewer can tune to the "Wall Street Week" program on either wireless channel 13 or cable channel 13. Simultaneously, different programs are transmitted on each of the other television and radio transmissions.

Controller, 20, has preprogrammed the RAM associated with the control processor, 39J, of the controller, 39, of decoder, 30, with bit information of a channel mark associated with each transmission of television programming received at decoder, 30. (While wireless channel 13 and cable channel 13 may transmit the same programming, they have

different channel marks.) At said RAM, said control processor, 39J, maintains, associated with appropriate channel mark information, monitor information records of the last command containing meter-monitor program identification information inputted via each channel transmission. Said records include program unit identification information. At the outset of the example, no transmission of "Wall Street Week" program unit identification information has yet occurred, and the program unit information associated with the source mark of wireless channel 13 and, separately, with the source mark of cable channel 13 is the unit information of the television programming transmitted immediately before the start of the "Wall Street Week" transmission.

At the outset of example #5, the contact lever of switch, 1, is connected to said first alternate contact of switch, 1, to which is inputted the full spectrum of frequencies transmitted on said cable, and mixer, 3, is set to select the frequency of channel 13. Thus transmissions on cable channel 13 are inputted to decoder, 30. Furthermore, the EOFS valve, 39F, of controller, 39, of decoder, 30, has identified an end of file signal embedded in the inputted channel 13 transmission and is set to receive transfer SPAM message information; the matrix switch, 39I, of said controller, 39, is set to transfer SPAM message information from said EOFS valve, 39F, to said control processor, 39J; and said control processor, 39J is set to receive and process header information of a SPAM message.

Example #5 begins with the embedding and transmitting, at the remote station that originates the "Wall Street Week" broadcast, of the first message of the "Wall Street Week" program which is the message of the first combining synch command. The transmission of said broadcast is received at the remote cable transmission station that transmits the multi-channel cable transmission inputted to signal processor, 200; combined into the full spectrum cable transmission on the frequency of channel 13; and retransmitted. Said cable transmission is inputted via said first alternate contact of switch, 1, and said contact lever to mixer, 3. Mixer, 3, selects the frequency of channel 13 and inputs said frequency of interest, at a fixed frequency, to TV signal decoder, 30.

Receiving said frequency of interest causes decoder, 30, (which is shown in greater detail in FIG. 2A and whose controller, 39, is shown in greater detail in FIG. 3A) to receive and process the command information of said first message. The inputted frequency of channel 13 is inputted, first, to filter, 31, which filters said input and outputs the one TV channel signal of channel 13 to amplitude demodulator, 32. Demodulator, 32, demodulates said inputted channel signal using standard demodulator techniques and transfers the demodulated channel signal of said channel 13 to digital detector, 38; line receiver, 33; and audio demodulator, 35. Thereafter, the embedded information of the first combining synch command is caused to be recorded at the SPAM-input-signal register memory of the control processor, 39J, of said decoder, 30, in the same fashion that the embedded information of said message is detected and recorded at decoder, 203, in example #3. Receiving said embedded information causes the binary SPAM information of said first command, with error correcting information, to be detected at detector, 34; checked and corrected, as necessary, at processor, 39B; converted into locally usable binary information at processor, 39D; and recorded at the SPAM-input-signal memory of said control processor, 39J.

The control apparatus of decoder, 30, is preprogrammed to process said information as monitor information and local control information. (Hereinafter, said first command may be called the 1st command (#5).) Receiving said first command causes the preprogrammed instructions at the RAM and ROM associated with control processor, 39J, to cause control processor, 39J, to process the information of said command in the following fashion. In a predetermined fashion, control processor, 39J, locates the monitor information that it retains in said RAM associated with the channel mark of cable channel 13 and compares the "program unit identification code" of said first command with the program unit information of said monitor information in RAM. No match results which indicates cable channel 13 is transmitting a new program unit. Not resulting in a match causes said controller, 39, automatically to transfer information of new programming to microcomputer, 205, and to transfer to buffer/comparator, 14, for further processing said monitor information in RAM which is monitor information of the programming transmitted on cable channel 13 prior to the "Wall Street Week" program. Automatically, said control processor, 39J, causes matrix switch, 39I, to cease transferring information from said EOFS valve, 39F, to control processor, 39J, and commence transferring information from control processor, 39J, to buffer/comparator, 8, (to which said matrix switch, 39I, has capacity to transfer information). Automatically said control processor, 39J, transmits a message that consists of binary information of a "00" header (indicating a command with execution and meter-monitor segments) then the execution segment information of the pseudo command then a meter-monitor segment containing said monitor information in RAM (including the associated channel mark and the format information of said information) then any padding bits required to end said message. (Hereinafter, said message whose transmission is caused by receiving said first command is called the "1st-old-program-command (#5).") Then, in a predetermined fashion, control processor, 39J, determines that said first command contains subject matter meter-monitor information causing said control processor, 39J, to transmit a message that consists of binary information of a "00" header then particular execution segment information that is addressed to microcomputer, 205, (and that causes microcomputer, 205, to process the information of the meter-monitor segment immediately following said execution segment information as new programming now being transmitted on the channel of the channel mark of said meter-monitor segment segment) then meter-monitor segment information that includes the "program unit identification code" and subject matter information of said first command and the channel mark of cable channel 13 as well as appropriate meter-monitor format information then any padding bits required to end said message. (Said message whose transmission is caused by receiving said first command enables microcomputer, 205, in a fashion described more fully below, to tune automatically to receive the program that said "program unit identification code" identifies if said program is of interest, and said message is called, hereinafter, the "1st-new-program-message (#5)".) Then said control processor, 39J, deletes from said RAM all information of said monitor information in RAM except the information of said channel mark and records at said RAM, associated with said channel mark, the meter-monitor segment information of the information at said SPAM-input-signal memory, which is said first command, but replaces the meter-monitor format information that is recorded with new format information that reflects the addition of a channel mark. Finally, controller, 39J, transmits particular detection-complete information to controller, 20; causes all apparatus of decoder, 30, except said RAM to

cease receiving SPAM message information and delete all information received on said frequency of interest (that is, cable channel 13); and causes said matrix switch, 39I, to cease transferring information from said control processor, 39J, to said buffer/comparator, 8, and commence transferring SPAM message information from EOFS valve, 39F, to its null output.

Receiving said detection-complete information causes controller, 20, to cause oscillator, 6, to cause the selection of the next channel in the predetermined television channel selection pattern: wireless channel 5. Automatically oscillator, 6, causes switch, 1, to shift its contact lever from the first alternate contact to the second alternate contact to which wireless transmissions are inputted and causes mixer, 3, to select the frequency of channel 5 and input said frequency of interest, at a fixed frequency, to decoder, 30. Controller, 20, then transmits a particular preprogrammed wireless-5 instruction to said control processor, 39J, that informs said processor, 39J, wireless channel 5 is inputted to decoder, 30.

Receiving said wireless-5 instruction causes control processor, 39J, to cause all apparatus of decoder, 30, to commence receiving, detecting, and processing SPAM message information embedded in the inputted frequency of interest.

When the input of wireless channel 5 to decoder, 30, commences, the remote wireless station transmitting the channel 5 transmission is transmitting the embedded signal information of an information segment following a SPAM command. Shortly thereafter, embedded signal information of an end of file signal then a combining synch command with a "01" header is transmitted on wireless channel 5. Said command instructs ITS controller/computers, such as 73 in FIG. 6 (except that the intermediate transmission station of this transmission is a wireless transmission station rather than a cable station), to load and run the contents of the information segment following said command. The meter-monitor field of said command contains no subject matter information but identifies a particular super market chain commercial program unit.

Receiving the inputted frequency of interest of wireless channel 5 at decoder, 30, causes filter, 31, to filters the inputted fixed frequency and output the one TV channel signal of channel 5 to amplitude demodulator, 32; causing demodulator, 32, to demodulate said inputted channel signal and transfer the demodulated signal to line receiver, 33; causing line receiver, 33, to detect said embedded signal information and transmit it to digital detector, 34; causing digital detector, 34, to detect the binary information of said signal information and transfer said binary information to controller, 39. Receiving said binary information at controller, 39, causes the binary SPAM information of the wireless channel 5 transmission to be checked and corrected, as necessary, at processor, 39B; converted into locally usable binary information at processor, 39D; and checked for end of file signal information at EOFS valve, 39F, and transmitted to the null output of matrix switch, 39I, until EOFS valve, 39F, detects an end of file signal.

In due course, said EOFS valve, 39F, receives the aforementioned end of file signal causing said valve, 39F, to detect said signal and transmit the aforementioned interrupt signal of EOFS-signal-detected information to said control processor, 39J. Receiving said EOFS-signal-detected

information causes control processor, 39J, to transmit the aforementioned discard-and-wait instruction to EOFS valve, 39F, and to cause said matrix switch, 39I, to cease transferring SPAM message information from said EOFS valve, 39F, to its null output information and commence transferring SPAM message information from said valve, 39F, to said control processor, 39J. Receiving said instruction causes said valve, 39F, to set the information at the EOFS WORD Counter of said valve, 39F, to "00000000" (thereby discarding information of said end of file signal) and to transmit the aforementioned complete-and-waiting information to control processor, 39J, as an interrupt signal. Receiving said complete-and-waiting information causes control processor, 39J, to transmit the aforementioned reopen-flow instructions to EOFS valve, 39F, causing said valve, 39F, to recommence processing inputted signal words in its preprogrammed fashion and transferring said words to matrix switch, 39I, and control processor, 39J, commences waiting to receive from said valve the binary information of a subsequent SPAM header.

The command that then follows on wireless channel 5 contains one example of an execution segment that invokes no controlled functions at the station of FIG. 3. Said command is addressed to intermediate transmission station controller/computers. Its instructions control, among others, the controller/computer of the remote station transmitting the wireless channel 5 transmission. (FIG. 6 shows one example of such a controller/computer, 73.) The subscriber station of FIG. 3 is an ultimate subscriber station, and the commands that invoke controlled functions at the computer of the station of FIG. 3 are those that are addressed to URS microcomputers, 205.

Nevertheless, control processor, 39J, of decoder, 30, certainly has capacity to process the meter-monitor information of said command for information that identifies the programming in which it is embedded. (Hereinafter, said command is called the "2nd command (#5).")

Receiving the binary information of said command causes control processor, 39J, to record said binary information at said SPAM-input-signal register memory then locate and compare the "program unit identification code" of said command with the program unit information of the monitor information that it retains in said RAM associated with the channel mark of wireless channel 5. Said "code" identifies a particular super market chain commercial program unit and because no information of said "code" has previously been received at control processor, 39J, no match results. Not resulting in a match causes said control processor, 39J, to cause matrix switch, 39I, to cease transferring information from said EOFS valve, 39F, to control processor, 39J, and commence transferring information from control processor, 39J, to buffer/comparator, 8; to transmit a message that consists of binary information of a "00" header then the execution segment information of the pseudo command then a meter-monitor segment containing said monitor information in RAM (including the associated channel mark and the format information of said information) then any padding bits required to end said message (which message is called, hereinafter, the "2nd-old-program-message (# 5)"); to determine that said command does not contain subject matter meter-monitor information (causing said control processor, 39J, not to transmit a message that enables microcomputer, 205, to tune receiver apparatus automatically but to transmit a new program message for processing by buffer/comparator, 14, alone); and to transmit a message that consists of binary information of a "00" header

then the execution segment information of the pseudo command then meter-monitor segment information that includes the "program unit identification code" of said 2nd command (#5) and the channel mark of cable channel 13 as well as appropriate meter-monitor format information then any padding bits required to end said message (which message is called, hereinafter, the "2nd-new-program-message (#5)") Automatically, said control processor, 39J, then deletes from said RAM all information of said monitor information in RAM except the information of said channel mark and records at said RAM, associated with said channel mark, the meter-monitor segment information of the information at said SPAM-input-signal memory, which is said 2nd command (#5), but replaces the meter-monitor format information that is recorded with new format information that reflects the addition of a channel mark. Finally, controller, 39J, transmits particular detection-complete information to controller, 20; causes all apparatus of decoder, 30, except said RAM to cease receiving SPAM message information and delete all information received on said wireless channel 5; and causes said matrix switch, 39I, to cease transferring information from said control processor, 39J, to said buffer/comparator, 8, and commence transferring SPAM message information from EOFS valve, 39F, to its null output.

Said detection-complete information causes controller, 20, to cause oscillator, 6, to cause the selection of the next channel in the predetermined television channel selection pattern: wireless channel 9. Automatically oscillator, 6, causes mixer, 3, to select the frequency of channel 9 and input said frequency of interest, at a fixed frequency, to decoder, 30. Controller, 20, then transmits a particular preprogrammed wireless-9 instruction to said control processor, 39J, that informs said processor, 39J, wireless channel 9 is inputted to decoder, 30.

Receiving said wireless-9 instruction causes control processor, 39J, to cause all apparatus of decoder, 30, to commence receiving, detecting, and processing SPAM message information embedded in the inputted frequency of interest.

When the input of wireless channel 9 to decoder, 30, commences, the remote wireless station transmitting the channel 9 transmission is transmitting no signal information in the normal transmission pattern.

EOFS valve, 39F, of decoder, 30, waits to receive detected SPAM signal information, but none is transmitted by said remote wireless station.

Controller, 20, has capacity for keeping track of elapsed time, and after determining in a predetermined fashion that a particular predetermined period of time has elapsed from the input of wireless channel 9 to decoder, 30, controller, 20, automatically causes control processor, 39J, to cause all apparatus of decoder, 30, cease receiving SPAM message information and delete all information received on said wireless channel 9 and causes oscillator, 6, to cause the selection of the next channel in the predetermined television channel selection pattern: wireless channel 13. Automatically, oscillator, 6, causes mixer, 3, to select the frequency of channel 13 and input said frequency to decoder, 30. Controller, 20, then transmits a particular preprogrammed wireless-13 instruction to said control processor, 39J, that informs said processor, 39J, wireless channel 13 is inputted to decoder, 30.

Receiving said wireless-13 instruction causes control processor, 39J, to

cause all apparatus of decoder, 30, to commence receiving, detecting, and processing SPAM message information embedded in the inputted frequency of interest.

The remote wireless station transmitting the channel 13 transmission is transmitting the same "Wall Street Week" program that is transmitted by the remote cable station transmitting the cable channel 13 transmission. When the input of wireless channel 13 to decoder, 30, commences, said remote wireless station is still transmitting the binary information of the information segment following the first combining synch command of said "Wall Street Week" program.

In due course said remote wireless station transmits the end of file signal that terminates said information segment, and the EOFS valve, 39F, of decoder, 30, receives and detects said signal, in its end of file detecting fashion, causing said valve, 39F, to transmit the aforementioned EOFS-signal-detected information to said control processor, 39J. Just as applied in the case of the 2nd command (#5), receiving said EOFS-signal-detected information causes control processor, 39J, to cause EOFS valve, 39F, to discard all information of said end of file signal; to cause said matrix switch, 39I, to cease transferring SPAM message information from said EOFS valve, 39F, to its null output information and commence transferring SPAM message information from said valve, 39F, to said control processor, 39J; then to cause EOFS valve, 39F, to recommence processing inputted signal words in its preprogrammed fashion and transferring said words to matrix switch, 39I; and to commence waiting to receive from said switch, 39I, the binary information of a subsequent SPAM header.

Subsequently, said remote wireless station transmits the second combining synch command of the "Wall Street Week" program. (Hereinafter, said command may be called the "3rd command (#5).")

Receiving the binary information of said command causes control processor, 39J, to record said binary information at said SPAM-input-signal register memory then locate and compare the "program unit identification code" of said command with the program unit information of the monitor information that it retains in said RAM associated with the channel mark of wireless channel 13. Since this is the first monitor information of the "Wall Street Week" program received at control processor, 39J, from an inputted wireless channel 13 transmission, no match results. Not resulting in a match causes said control processor, 39J, automatically to cause matrix switch, 39I, to cease transferring information from said EOFS valve, 39F, to control processor, 39J, and commence transferring information from control processor, 39J, to buffer/comparator, 8, then to transmit a message that consists of binary information of a "00" header then the execution segment information of the pseudo command then a meter-monitor segment containing said monitor information in RAM (including the associated channel mark and the format information of said information) then any padding bits required to end said message. (Hereinafter, said message is called the "3rd-old-program-message (#5)".) Then, in a predetermined fashion, control processor, 39J, determines that said command contains subject matter meter-monitor information causing said control processor, 39J, to transmit a message that consists of binary information of a "00" header then the aforementioned execution segment information that is addressed to microcomputer, 205, (and that causes microcomputer, 205, to

process the information of the meter-monitor segment immediately following said execution segment information as new programming now being transmitted on the channel of the channel mark of said meter-monitor segment segment) then meter-monitor segment information that includes the "program unit identification code" and subject matter information of said command and the channel mark of wireless channel 13 as well as appropriate meter-monitor format information then any padding bits required to end said message. (Hereinafter, said message is called the "3rd-new-program-message (#5)".) Then automatically said control processor, 39J, deletes from said RAM all information of said monitor information in RAM except the information of said channel mark and records at said RAM, associated with said channel mark, the meter-monitor segment information of the information at said SPAM-input-signal memory, which is said 3rd command (#5), but replaces the meter-monitor format information that is recorded with new format information that reflects the addition of a channel mark. Finally, controller, 39J, transmits particular detection-complete information to controller, 20; causes all apparatus of decoder, 30, except said RAM to cease receiving SPAM message information and delete all information received on said frequency of interest (that is, wireless channel 13); and causes said matrix switch, 39I, to cease transferring information from said control processor, 39J, to said buffer/comparator, 8, and commence transferring SPAM message information from EOFS valve, 39F, to its null output.

Receiving said detection-complete information causes controller, 20, to cause oscillator, 6, to cause selection of the next channel in the predetermined television channel selection pattern: cable channel 2. Automatically oscillator, 6, causes switch, 1, to shift its contact lever from the second alternate contact to the first alternate contact to which cable transmissions are inputted and causes mixer, 3, to select the frequency of channel 2 and to input said frequency of interest, at a fixed frequency, to decoder, 30. Controller, 20, then transmits a particular preprogrammed cable-2 instruction to said control processor, 39J, that informs said processor, 39J, cable channel 2 is inputted to decoder, 30.

While TV signal decoder, 30, is processing signal information in video transmissions inputted from switch, 1, and mixer, 3, radio signal decoder, 40, is, in a similar fashion, processing SPAM information in radio transmissions inputted from mixer, 2.

(Radio signal decoder, 40, is shown in greater detail in FIG. 2B. The controller, 44, of decoder, 40, is identical, in composition, to the controller, 39, of FIG. 3A. And the components of said controller, 44, are referred to, hereinafter, using the same alphanumeric identification system that applies to the components of FIG. 3A. For example, the control processor of said controller, 44, is referred to, hereinafter, as control processor, 44J.)

Controller, 20, has preprogrammed all apparatus of decoder, 40, appropriately to receive and process the SPAM information of said radio transmission in the same fashion that controller, 30, receives and processes SPAM information embedded in its inputted television transmissions. Control processor, 44J, controls all controlled apparatus of decoder, 40, and causes radio decoder, 42, to detect signal information in the normal radio transmission location. At the RAM associated with the control processor, 44J, is bit information of a

channel mark associated with each radio frequency transmission received at decoder, 40. (The frequency identification information of decoder, 40, is called "channel marks" here rather than "frequency marks" for simplicity of exposition.) At said RAM, control processor, 44J, maintains, associated with appropriate channel mark information, monitor information records of the last command containing meter-monitor program identification information inputted via each frequency transmission.

At the outset of the example, mixer, 2, is selecting the frequency of 100.0 MHz of the FM frequency spectrum and inputting said frequency, at a fixed frequency, to decoder, 40. EOFS valve, 44F, has identified an end of file signal embedded in the inputted 100.0 MHz frequency transmission and is set to receive and transfer SPAM message information. Matrix switch, 44I, is set to transfer SPAM message information from EOFS valve, 44F, to control processor, 44J. And control processor, 44J is set to receive and process header information of a SPAM message.

Subsequently, the remote FM radio station that originates the 100.0 MHz broadcast embeds in the normal transmission location of its transmission and transmits a SPAM message that consists of a "00" header; the pseudo command execution segment; a meter-monitor segment that includes particular program unit identification information, particular subject matter information, and particular appropriate meter-monitor format information; and any required padding bits. (Hereinafter, the command of said message is called the "4th command (#5)."; Said transmission is received at the remote cable transmission station that transmits the multi-channel cable transmission inputted to signal processor, 200; combined into the full spectrum cable transmission on the 100.0 MHz frequency; and retransmitted. Mixer, 2, selects said 100.0 MHz frequency of said transmission and inputs said frequency, at a fixed frequency, to radio signal decoder, 40.

Receiving said frequency causes decoder, 40, to detect and process the command information of said 4th command (#5). The inputted frequency of channel 13 is inputted, first, to radio receiver circuitry, 41, which receives the radio information of said frequency and inputs said information to radio decoder, 42, which decodes the the embedded signal information of said command and transmits said signal information to digital detector, 43, which detects the binary information with error correcting bit information of said command and transfers said binary and bit information to controller, 44. Thereafter, the embedded information of said command is caused to be recorded at the SPAM-input-signal register memory of control processor, 44J, in the same fashion that the embedded information of the 1st command (#5) is detected and recorded at decoder, 30. Receiving the embedded information of the 4th command (#5) causes the binary SPAM information of said command to be detected at detector, 44; checked and corrected, as necessary, at processor, 44B; converted into locally usable binary information at processor, 44D; and recorded at the SPAM-input-signal memory of said control processor, 44J.

Receiving said command causes the instructions preprogrammed at the RAM and ROM associated with control processor, 39J, to cause control processor, 44J, to process the information of said command in the following fashion. In a predetermined fashion, control processor, 44J, locates the monitor information that it retains in said RAM associated with the channel mark of the 100.0 MHz frequency and compares the "program unit identification code" of said command with the program unit

information of said monitor information in RAM. No match results which indicates a new program unit is being transmitted on said frequency. Not resulting in a match causes said controller, 44, automatically to transfer information of new programming to microcomputer, 205, and to transfer to buffer/comparator, 14, for further processing said monitor information in RAM which is monitor information of prior programming transmitted on said frequency. Automatically, said control processor, 44J, causes matrix switch, 44I, to cease transferring information from EOFS valve, 44F, to control processor, 44J, and commence transferring information from control processor, 44J, to buffer/comparator, 8, (to which said matrix switch, 44I, has capacity to transfer information). Automatically said control processor, 44J, transmits a message that consists of binary information of a "00 " header then the execution segment information of the pseudo command then a meter-monitor segment containing said monitor information in RAM (including the associated channel mark and the format information of said information) then any padding bits required to end said message. (Hereinafter, said transmission of is called the "1st-old-radio-program-message (#5)".) Then, in a predetermined fashion, control processor, 4J, determines that said command contains subject matter meter-monitor information, causing control processor, 44J, to transmit a message that consists of binary information of a "00" header then particular execution segment information that is addressed to microcomputer, 205, (and that causes microcomputer, 205, to process the meter-monitor information of said message as new programming now being transmitted on said 100.0 MHz frequency) then meter-monitor segment information that includes the "program unit identification code" and subject matter information of said first command and the channel mark of said 100.0 MHz frequency as well as appropriate meter-monitor format information then any padding bits required to end said message. (Said message is called, hereinafter, the "1st-new-radio-program-message (#5)".) Then said control processor, 44J, deletes from said RAM all information of said monitor information in RAM except the information of said channel mark and records at said RAM, associated with said channel mark, the meter-monitor segment information of the information at said SPAM-input-signal memory, which is said command, but replaces the meter-monitor format information that is recorded with new format information that reflects the addition of a channel mark. Finally, controller, 44J, transmits particular radio-detection-complete information to controller, 20; causes all apparatus of decoder, 40, except said RAM to cease receiving SPAM message information and delete all information received on said frequency of interest (that is, frequency 100.0 MHz); and causes said matrix switch, 44I, to cease transferring information from said control processor, 44J, to said buffer/comparator, 8, and commence transferring SPAM message information from EOFS valve, 44F, to its null output.

Said radio-detection-complete information causes controller, 20, to cause oscillator, 6, to cause the selection of the next frequency in the predetermined radio frequency selection pattern: 99.0 MHz. Automatically oscillator, 6, causes mixer, 2, to select said frequency and input it, at a fixed frequency, to decoder, 40. Controller, 20, then transmits a particular preprogrammed radio-99.0 instruction to control processor, 44J, that informs said processor, 44J, 99.0 MHz is inputted to decoder, 40.

Receiving said radio-99.0 instruction causes control processor, 44J, to cause all apparatus of decoder, 40, to commence receiving, detecting, and

processing SPAM message information embedded in the inputted frequency of interest.

When the input of FM radio frequency 99.0 MHz to decoder, 40, commences, the remote station transmitting the 99.0 MHz radio transmission is transmitting no SPAM information in the normal transmission location.

EOFS valve, 44F, of decoder, 40, waits to receive detected SPAM signal information, but none is transmitted by said remote wireless station.

After determining, in a predetermined fashion, that a particular predetermined period of time has elapsed from the input of said 99.0 MHz frequency to decoder, 40, controller, 20, automatically causes control processor, 44J, to cause all apparatus of decoder, 40, to cease acting to receive SPAM message information embedded in said frequency and to delete all information received on said frequency and causes oscillator, 6, to cause the selection of the next frequency in the predetermined radio frequency selection pattern: 100.0 MHz. Automatically, oscillator, 6, causes mixer, 2, to select said frequency and input it, at a fixed frequency, to decoder, 40. Controller, 20, then transmits a particular preprogrammed radio-100.0 instruction to control processor, 44J, that informs said processor, 44J, 100.0 MHz is inputted to decoder, 40.

In the example, buffer/comparator, 8, receives from decoder, 30, the 1st-, 2nd-, and 3rd-old-program-message (#5) messages and the 1st-, 2nd-, and 3rd-new-program-message (#5) messages and from decoder, 40, the 1st-old-radio-program-message (#5) and 1st-new-radio-program-message (#5) messages.

Receiving each one of said messages causes buffer/comparator, 8, first, to place said one at a particular received signal location at buffer/comparator, 8, then to compare a particular portion the first X bits immediately after the first H bits of said binary information (which X bits is the execution segment of said one) to the aforementioned particular comparison information in its automatic comparing fashion. In each case, no match results which signifies that none of said messages instructs URS signal processors, 200, to decrypt. Not resulting in a match causes buffer/comparator, 8, to transfer each one directly to controller, 12, as soon as controller, 12, becomes prepared to receive said one.

(The system of the present invention has capacity for processing encrypted SPAM program identification information; however, in the preferred embodiment, the decryption of said information takes place at the decryptors, 39K, 44K, or 47K, of the controllers, 39, 44, or 47, of decoders, 30, 40, or of FIG. 2C, before said decoders input their detected SPAM program identification information to buffer/comparators, 8. Such decryption is affected in the fashion of the decryption of the first and second messages of example (#4) at decoder, 203.)

All eight of said messages are commands. The 1st- and 3rd-new-program-message (#5) and the 1st-new-radio-program-message (#5) signals are addressed to microcomputer, 205. Each informs said microcomputer of new programming transmissions to which said microcomputer can tune appropriate station receiver and display apparatus in fashions described below. (Hereinafter said commands are called "guide commands" because they can guide station control apparatus to desired

programming.) By contrast, the 1st-, 2nd-, and 3rd-old-program-message (#5) messages, the 2nd-new-program-message (#5), and the 1st-old-radio-program-message (#5) inform no station control apparatus of new programming transmissions because said commands are addressed to no apparatus; the execution segment of each is the aforementioned pseudo-command. (Hereinafter, each said signal is called a "transparent command" because no subscriber station control apparatus "sees" said signal.)

Receiving each transparent or guide command from buffer/comparator, 8, causes controller, 12, (which is equipped with a matrix switch, 12I, and a control processor, 12J, with associated RAM and ROM) to process each, in turn, in its preprogrammed fashions (which are similar to the preprogrammed fashions of controller, 39, of decoder, 203). Receiving each command causes controller, 12, to record said command at the SPAM-input-signal register memory of controller, 12, then to compare the execution segment of each command to the aforementioned controlled-function-invoking-@12 information. Each execution segment of a guide command matches particular preprogrammed transfer-this-message-to-205-@12 information that invokes particular preprogrammed instructions that cause controller, 12, to input the message of said command to buffer, 39G, of controller, 39, of decoder, 203. (Receiving said message causes said controller, 39, to input information of said command to microcomputer, 205, thereby informing microcomputer, 205, that new programming of the particular subject matter and program identification unit identified of said guide command is being transmitted on the channel of the channel mark of said guide command and causing microcomputer, 205, to process in a fashion that is described more fully below.) Each execution segment of a transparent command matches particular preprogrammed pseudo-function-@12 information that invokes no particular preprogrammed controlled function instructions.

In example #5, controller, 12, is preprogrammed to process monitor information, and completing the controlled functions invoked by any given message causes controller, 12, automatically to process the information of said message as monitor information, in the fashion of controller, 39, of decoder, 203, in example #3. Automatically after transmitting the last bit of each guide command or determining that the execution segment of each transparent command invokes no controlled function, controller, 12, commences processing the information at said SPAM-input-signal memory as monitor information. Automatically, control processor, 12J, transfers to buffer/comparator, 14, via matrix switch, 12 I, header information that identifies a transmission of monitor information of available programming then all of the information that is recorded at said SPAM-input-signal memory. (In each example #5 case, the information that is transferred--together with its newly added header information--continues to be called by its previously assigned name; for example, the 1st-old-radio-program-message (#5).) Then controller, 12, from memory all information of said given message and commences waiting to receive the binary information of a subsequent message from buffer/comparator, 8.

Particular ones of said eight messages convey first instances of particular program unit identification monitor information associated with particular channel marks. Said ones are the 1st-, 2nd-, and 3rd-new-program-message (#5) messages and the 1st-new-radio-program-message (#5). Others of said messages convey last instances of such information associated with said channel marks. Said others are the 1st-,

2nd-, and 3rd-old-program-message (#5) messages and the 1st-old-radio-program-message (#5). (Hereinafter, monitor information messages that convey first instances of particular program unit identification information associated with particular channel marks are called "new programming messages," and messages that convey last instance information are called "old programming messages.")

Signal processor, 200, processes the monitor information of said messages in a fashion that is similar to the monitor information processing of examples #3 and #4.

Receiving each of said eight messages (with said header information that identifies monitor information of available programming added) causes buffer/comparator, 14, to determine that said header information matches particular preprogrammed monitor-information-identification information, causing buffer/comparator, 14, to input each message, in turn, to onboard controller, 14A.

Receiving any given old programming message causes onboard controller, 14A, to execute particular preprogrammed process-monitor-info-of-available-programming instructions. Said instructions cause onboard controller, 14A, to determine that the channel mark and program unit identification information in said old programming message matches the channel mark and program unit identification information of a selected monitor information record previously initiated by a particular new programming message and to update the information of said selected record by modifying the information content of said record by adding and/or deleting and/or replacing information in such a way that the information of said record reflects to the fullest extent which particular programming is available on which channels at the station of FIG. 3 (and at selected other stations that are preprogrammed and preconfigured to collect monitor information) and by recording date and time information, received from clock, 18, in such a way that the information of said record reflects when said particular programming is available. The programming monitored for availability and the information recorded can include not only programming identified by the aforementioned "program unit identification codes" that identify television programs but also, for example, computer programming information such as the information, in the meter-monitor segment of the first combining synch command of the "Wall Street Week" example, that identifies the program instruction set that follows said command and the supplier of said set.

Receiving any given new programming message causes onboard controller, 14A, to determine that the program unit identification information in said message does not match the program unit identification information of that selected monitor information record whose channel mark matches the channel mark of said new programming message, causing onboard controller, 14A, automatically to cause signal processor, 200, to record said selected monitor information record at recorder, 16, in the fashion that onboard controller, 14A, caused signal processor, 200, to record the aforementioned record of prior programming upon receiving the 1st monitor information (#3). Then, automatically, onboard controller, 14A, executes the aforementioned process-monitor-info-of-available-programming instructions. Said instructions cause onboard controller, 14A, to initiate a new monitor record that reflects the availability of the programming identified in said new programming message. Automatically, said instructions cause onboard controller, 14A, to delete all

information at the record location of said selected monitor information record except the channel mark associated with said record and to record at said record location the "program unit identification code" information of said new programming message, such other selected information of said new programming message that identifies other particular programming is available on the channel of said channel mark, and current date and time information, received from clock, 18. In this fashion, the system of the present invention initiates records at the station of FIG. 3 (and at selected other stations that are preprogrammed and preconfigured to collect monitor information) that reflect to the fullest extent which particular programming becomes available at said station (and said other stations), on which channels, and when

Operating Signal Process of Systems . . . Signal Record Transfer

In examples #3, #4, and #5, the transmission of SPAM signal information causes signal processor, 200, to transfer signal record information by telephone to remote station computers. At the outset of each example, recorder, 16, has reached a level of fullness where recording the next signal record will cause the quantity of recorded information to equal or exceed the particular fullness information of said recorder, 16. In example #3 and #4, receiving the first message of the "Wall Street Week" program causes decoder, 203, to transfer to buffer/comparator, 14, the 1st monitor information (#3) and the 1st meter & monitor information (#4), respectively, and receiving the 1st monitor information (#3) and the 1st meter & monitor information (#4) causes buffer/comparator, 14, to transfer record information of the prior program displayed at monitor, 202M, to recorder, 16, and causes recorder, 16, to record said information. In example #5, receiving transmitted SPAM message information causes decoders, 30 and 40, to transmit the 1st-new-program-message (#5) and the 1st-new-radio-program-message (#5) messages, respectively, and receiving information of said 1st-new-program-message (#5) and said 1 st-new-radio-program-message (#5) causes buffer/comparator, 14, to transfer old programming record information to recorder, 16, and causes recorder, 16, to record said information. In each example, the transfer of the first record information from buffer/comparator, 14, causes recorder, 16, to execute the automatic telephone signal record transfer sequence described above

In each example, when the automatic processing caused by the received SPAM signal information reaches the point at which recorder, 16, finishes recording the first signal record information transferred from buffer/comparator, 14, recorder, 16, measures the quantity of its recording capacity that holds signal records, in a predetermined fashion, and determines that said quantity is equal to or greater than said particular fullness information. Said determining causes recorder, 16, to transfer a particular instruct-to-call instruction to controller, 20, that causes controller, 20, to activate telephone connection, 22, and proceed with a particular preprogrammed telephone signal record transfer sequence that is fully automatic.

The first stage of said sequence involves transferring audit information to a particular first host computer at a first remote station. Controller, 20, transfers the telephone number, 1-800-AUDITOR, to auto dialer, 24, and causes said dialer, 24, to dial said number. Said first computer answers said telephone call, and in a fashion well known in the art, controller, 20, and said first computer automatically establish

telephone communications. Automatically, controller, 20, causes telephone connection, 22, to transfer particular identifying information that includes the unique digital identifying code of ROM, 21, to said first computer followed by a particular instruct-to-receive signal. Said instruct-to-receive signal causes said first computer automatically to prepare to receive audit records then to transfer a particular start signal via connection, 22, to controller, 20. Receiving said start signal, sent automatically in response to controller, 20's, instruct-to-receive signal, causes controller, 20, to cause recorder, 16, to transmit all recorded meter audit records and particular other audit information to telephone connection, 22, which causes said connection, 22, to transmit said records and information to said first computer. When recorder, 20, transmits the last bit of said record and other information, recorder, 20, transmits particular finished-with-first-stage information to controller, 20, which causes controller, 20, to transmit a particular acknowledge receipt instruction to said first computer. Automatically said first computer determines, in a predetermined fashion, that the audit information has been received correctly and completely, and said determining causes said first computer automatically to transmit a particular transmission complete signal to controller, 20. Receiving said complete signal causes controller, 20, to cause telephone connection, 22, to terminate said telephone call. Then controller, 20, transfers information to recorder, 16, that causes recorder, 16, to erase from memory all said record and other information that is not also meter charge information or monitor information.

Having completed the first stage, controller, 20, then commences automatically the second stage of said sequence which involves transferring meter charge information to a particular second host computer at a second remote station. Controller, 20, transfers the telephone number, 1-800-CHARGES, to auto dialer, 24, and causes the dialing of said number. But said number is busy. Telephone connection, 22, receives a telephone busy signal, well known in the art, and transfers information of said signal to controller, 20. Receiving said information causes controller, 20, to execute a preprogrammed redial sequence. Thereafter, whenever controller, 20, polls its input sources for input signal information in a polling fashion well known in the art, it causes dialer, 24, regularly to redial said number. Controller, 20, continues said redialing until said second computer answers said call.

Said redial sequence does not prevent controller, 20, from proceeding with other processing tasks; it merely defers execution of the remaining preprogrammed instructions of the second stage. When said second computer answers said call, controller, 20, will automatically execute said remaining instructions.

Having deferred further execution of the second stage, controller, 20, proceeds to the third stage which involves transferring monitor information to a particular third host computer at a third remote station. Controller, 20, causes the dialing of the telephone number, 1-800-MONITOR, and establishes telephone communications with said third computer. Automatically, controller, 20, causes the transfer to said third computer of particular identifying information and a particular instruct-to-receive signal causing said third computer to determine that it is not prepared to receive information and to respond with a particular call-back signal. Said call-back signal instructs controller, 20, to defer further execution of the third stage until a particular

deferred time--the first waiting moment after 1:00 AM the following morning--and causes controller, 20, to execute a preprogrammed time-check-and-determining sequence. Under control of said sequence, as a regular step in the sequence of the aforementioned polling fashion, controller, 20, checks the time of clock, 18, and determines whether said clock time is after said deferred time.

Having deferred further execution of the third stage, controller, 20, proceeds with other processing. The third stage is the final stage of said automatic telephone signal record transfer sequence. Accordingly, controller, 20, starts polling for instructions and commences regularly executing said redial and said time-check-and-determining sequences.

Subsequently, in the course of executing said redial instructions, controller, 20, and said second computer establish telephone communications in the fashion described in the first stage above. Controller, 20, then causes the transfer to said second computer of particular identifying information followed by a particular instruct-to-receive signal causing said second computer to respond with a particular start signal that causes controller, 20, to cause the transmitting of all recorded meter charge records to said second computer. When recorder, 20, finishes transmitting meter charge information, controller, 20, transmits a particular acknowledge receipt instruction to said second computer. Automatically said second computer responds with a particular transmission complete signal that causes controller, 20, to terminate said telephone call then to cause recorder, 16, to erase from memory all said meter charge information. Then, in a preprogrammed fashion, controller, 20, deactivates the redial sequence instruction portion of said polling sequence.

So completing the second stage causes controller, 20, once again to commence polling for instructions.

Subsequently, controller, 20, determines that said clock time is after said deferred time which causes controller, 20, automatically to deactivate said time-check-and-determining sequence sequence and recommence said third stage. Automatically, controller, 20, reestablishes telephone communications with said third computer and causes said third computer to transfer to controller, 20, its particular start signal. Then controller, 20, causes the transmitting of all recorded monitor records to said third computer. When said transmitting is finished, controller, 20, transmits a particular acknowledge receipt instruction to said third computer. Automatically said third computer responds with a particular transmission complete signal that causes controller, 20, to terminate said telephone call then to cause recorder, 16, to erase from memory all said monitor record information.

Completing the final deferred instructions of said automatic telephone signal record transfer sequence causes controller, 20, to end said sequence and commence processing in the conventional fashion.

In examples #3 and #4 (and #5 if information of said 1st-new-program-message (#5) reaches buffer/comparator, 14, before any other instance of monitor information), receiving the first message of the "Wall Street Week" program causes the apparatus of the FIG. 3 subscriber station to carry out said signal record transfer sequence. Simultaneously, other stations have reached a similar level of fullness,

and said command causes said other stations also to execute said transfer sequence. Accordingly, not only does transmitting said first message cause all the functions described above in example #3 and #4 (and #5), transmitting said message also causes apparatus at one and more subscriber stations to transfer recorded information selectively to one and more remote stations at the time of execution and at deferred times, causes computers at said stations to process said information, and causes said computers to transfer information, point-to-point, to said subscriber station apparatus.

Examples #3, #4, and #5 do not show the second message of the "Wall Street Week" program causing information to be recorded at the recorder, 16, of the subscriber station of FIG. 3. Accordingly, said message does not cause apparatus of said station to transfer of record information to one or more remote station computers.

Nevertheless, it is clear from the above exposition that the transmission of any SPAM command (including the pseudo command) that includes meter-monitor information can cause monitor record information to be recorded at the recorder, 16, of selected stations and can cause signal processors, 200, at selected ones of said stations (that is, at stations where recorders, 16, equal or exceed particular fullness information) to transfer meter and/or monitor record information selectively to one or more remote stations and cause computers at said stations to process the information in the fashions described herein.

(Indeed, as the above exposition makes clear, the impact of the transmission of SPAM information can be yet more complex and meaningful. In example #4, receiving the second message does cause selected stations to record monitor record information the recorders, 16, of said stations. Said stations are those stations that are preprogrammed to collect monitor information at which the first message is not decrypted but the second message is; at which, as a consequence, program unit identification information does not exist at SPAM-first-precondition memories and, hence, where FIG. 1C combinings fail to occur because the first precondition is not satisfied; and at which, as a consequence, receiving said second messages causes a 2nd monitor information (#4) transmission and causes processing of said 2nd monitor information (#4) at buffer/comparators, 14. At said stations, because no monitor information of the first "Wall Street Week" program message was previously processed--because none was decrypted--monitor record information of prior programming still exists at said buffer/comparators, 14, when said 2nd monitor information (#4) is received at said buffer/comparators, 14. At selected ones of said stations which ones where recorders, 16, will equal or exceed particular fullness information when the next instance of record information is recorded, receiving said second message causes the recording of said monitor record information of prior programming, causes the transferring of meter and/or monitor record information selectively to one or more remote stations, and causes computers at said stations to process the information in the fashions described herein.)

Regulating the Reception and Use of Programming . . . (Including Example # 6)

Examples #2 and #4, above, illustrate methods of controlling encryption and decryption means, well known in the art, within signal processing

systems to regulate (and meter) the reception and use of control instructions that generate combined medium overlay information and cause combinings to commence and cease at selected stations. Said means and methods involve the operation of preprogrammed cipher keys (such as keys J and Z) and cipher algorithms to decrypt transmitted information.

The present invention includes other apparatus and methods for regulating the reception and use of combined medium control instructions, and the apparatus and methods of the present invention that are used to control (and meter) combined medium communication can also regulate the reception and use of prior art electronic programming transmissions.

In the prior art, various means and methods exist for regulating the reception and use of electronically transmitted programming. Various scrambling means are well known in the art for scrambling, usually the video portion of analogue television transmissions in such a fashion that only subscriber stations with appropriate descrambling means have capacity to tune suitably to the television transmissions and display the transmitted television image information. Encryption/decryption means and methods, well known in the art, can regulate the reception and use of, for example, digital video and audio television transmissions, digital audio radio and phonograph transmissions, digital broadcast print transmission, and digital data communications. Other techniques, well known in the art, involve controlling interrupt means that may be as simple as on/off switches to interrupt or disconnect programming transmissions at stations that lack authorizing information or are determined in other fashions not to be duly authorized. Still other techniques, also well known in the art, involve controlling jamming means that spoil transmitted programming at stations that lack authorizing information or are determined not to be duly authorized, thereby degrading the usefulness of said programming. Such other techniques include, for example, inserting so-called "noise" into the transmitted programming which noise may be, for example, overlays of one or more separate transmissions.

The means and methods of the present invention for regulating reception and use of programming relate, in particular, to three features of the present invention. The computer system of the present invention has capacity at each subscriber station to compute station specific information based on preprogrammed information that exists at each station and that differs from station to station. Given this capacity, any central control station of the present invention that originates a SPAM transmission can cause subscriber station apparatus to decrypt received SPAM information in different fashions with each station decrypting its received information is its own station specific fashion. A central station can cause different stations to compute different station specific decryption cipher keys and/or algorithms to use in any given step of decryption or to compute station specific key and/or algorithm identification information that differs from station to station and controls each station in identifying the key and/or algorithm to use for any given step of decrypting. A second feature of the present invention is that effective SPAM processing depends on the correspondence between the transmitted SPAM information that causes processing at the subscriber stations and the information preprogrammed at the various stations that controls the SPAM processing at each station. In order for any given SPAM execution segment to invoke any given controlled function at any given station, the received binary information of said segment

(for example, "010011"), must match preprogrammed controlled-function-invoking information ("010011") at each station. This feature permits each station to be preprogrammed with station specific controlled-function-invoking information that differs from station to station (which means that no single SPAM execution segment could invoke a given function at all stations without first being processed at selected stations to render its information to correspond to the station specific preprogrammed invoking information of said stations). The third feature of the present invention is an extended system of means and methods for regulating the reception and use of SPAM information--including decryption key and algorithm information--that is illustrated in FIG. 4 and discussed more fully below.

By themselves, the first and second features provide a technique whereby a message such as the second message of the "Wall Street Week" program can take affect at only selected stations (such as those stations preprogrammed with decryption key J) without being decrypted at said stations. (Hereinafter, this technique is called "covert control.")

An example #6, that focuses on the second message of the "Wall Street Week" program and is set within the context of example #4, illustrates the operation of covert control.

In examples #1, #2, #3, and #4, the information of the execution segment of said second message, when unencrypted, is identical from example to example. For example, if said information is "100110" in example #1, it is "100110" in example #3 and, after decryption, in examples #2 and #4. And the preprogrammed execute-conditional-overlay-at-205 information that said information of the execution segment matches when compared with controlled-function-invoking information is also "100110".

But in example #6 the information of the execution segment of said second message is different; for example, said information is "111111". And the particular binary number that is selected--"111111" in the particular example--is selected because no subscriber station is preprogrammed, at the outset of the example, with any controlled-function-invoking information that is "111111". (In other words, were said "111111" information of the execution segment transmitted without any other action taking place first, transmitting said information would cause no controlled function to be executed at any subscriber station because said information would not match any controller-function-invoking information at any station.)

In example #6, two particular messages are transmitted each of which consists of a "01" header; execution, meter-monitor, and information segments; and an end of file signal. (Hereinafter, said messages are called the "1st supplementary message (#6)" and the "2nd supplementary message (#6)".) In each message, the information of said segments is encrypted prior to transmission in the same fashion that the information of the first message of example #4 is encrypted, except that the encryption is done with key J rather than key Z and the encrypted information of the execution segment instructs subscriber stations to decrypt with key J.

The "Wall Street Week" program originating studio embeds and transmits the 1st supplementary message (#6) before transmitting said second message.

Just as is the case with the first message of example #4, at the subscriber station of FIG. 3 (and at other stations that are preprogrammed with decryption key J), receiving the 1st supplementary message (#6) causes the apparatus of said station to decrypt said message (using key J) and execute any controlled functions that are invoked by the unencrypted execution segment of said message. Automatically, control processor, 39J, causes decryptor, 39K, to receive the information of said message; decryptor, 39K, decrypts the encrypted information of said message and transfers said message to EOFS valve, 39H; and EOFS valve, 39H, inputs the information of said message, unencrypted, to control processor, 39J, until the end of file signal of said message is detected. Automatically, control processor, 39J, compares the unencrypted information of the execution segment in said message to the aforementioned controlled-function-invoking information, and a match occurs with particular preprogrammed execute-at-39J information that causes control processor, 39J, to execute particular preprogrammed load-and-run-at-39J instructions.

Executing said instructions causes control processor, 39J, to record the received SPAM information of said 1st supplementary message (#6) in a fashion similar to the recording of the first message of example #4 except that the information of the information segment of said 1st supplementary message (#6) is recorded at particular RAM associated with control processor, 39J, rather than particular RAM of microcomputer, 205. Automatically, control processor, 39J, records all remaining command information of said 1st supplementary message (#6) together with any padding bits immediately following said command at the aforementioned SPAM-input-signal register memory then continues receiving the SPAM information of said message and loads said information (which is the information of the information segment of said message) at particular working memory of said RAM associated with control processor, 39J.

In due course, EOFS valve, 39H, receives complete information of the end of file signal that ends said 1st supplementary message (#6). Receiving said information causes EOFS valve, 39H, to transmit the aforementioned interrupt signal of EOFS-signal-detected information to control processor, 39J.

Receiving said signal while under control of said load-and-run-at-39J instructions causes control processor, 39J, to execute the information of the information segment of said 1st supplementary message (#6) that is loaded at said RAM as the so-called machine language instructions of one so-called job.

Executing said information causes control processor, 39J, in the predetermined fashion of the said information that is preprogrammed at said RAM at the time of execution by virtue of being so loaded prior to being so executed, to locate the location of that particular instance of controlled-function-invoking information that is "100110" (which is the execute-conditional-overlay-at-205 information that causes control processor, 39J, to execute the controlled function of said conditional-overlay-at-205 instruction) and modify the information at said location to be "111111". (Simultaneously, other control processors, 39J, and at other stations that are preprogrammed with decryption key J execute information of loaded information of said information segment and modify information of the execute-conditional-overlay-at-205 information,

at said control processors, 39J, to be "111111".)

In this fashion, the execute-conditional-overlay-at-205 information at the control processors, 39J, of those selected subscriber stations that are preprogrammed with information of decryption key J is altered from its standard "100110" and becomes "111111".

Accordingly, when the second message of the "Wall Street Week" program of example #6 is transmitted with its "111111" execution segment, said message is processed at those stations that are preprogrammed with said information of decryption key J precisely as the second message of example #3 is processed at said stations. (At all other stations, all information of said message is automatically discarded because the "111111" information of its execution segment fails to match any preprogrammed controlled-function-invoking information.)

The "Wall Street Week" program originating studio embeds and transmits the 2nd supplementary message (#6) after transmitting said second message.

At the subscriber station of FIG. 3 (and at other stations that are preprogrammed with decryption key J), receiving said 2nd supplementary message (#6) causes precisely the same processing that is caused by receiving the 1st supplementary message (#6) with just one exception. Whereas executing the loaded information of the information segment of the 1st supplementary message (#6) causes control processor, 39J, to locate that instance of controlled-function-invoking information that is "100110" and modify the information at the location of said "100110" to be "111111", executing the loaded information of the information segment of the 2nd supplementary message (#6) causes control processor, 39J, to locate that instance of controlled-function-invoking information that is "111111" and modify the information at the location of said "111111" to be "100110".

In this fashion, the execute-conditional-overlay-at-205 information at the control processors, 39J, of those selected subscriber stations that are preprogrammed with information of decryption key J is returned to its standard value: "100110". (Hereinafter, the normal binary value of a given instance of information that invokes a preprogrammed function--such as, for example, the "100110" that is the normal value of said execute-conditional-overlay-at-205 information--is called a "standard control-invoking value", and a value that temporary replaces a standard control-invoking value in the course a covert control application--such as "111111" in example #6--is called a "covert control-invoking value".)

Covert control provides significant benefits. One benefit is speed. For example, when covert control is employed, no time is spent decrypting messages (such as the second "Wall Street Week" message of examples #2 or #4) that convey combining synch commands. Thus the shortest possible interval of time can exist between the moment when a given combining synch command (such as the command of said second message) is embedded at the program originating studio and transmitted and the moment when it causes combining at those selected stations at which it causes combining. A second benefit arises out of the capacity to repeat. In example #6, after transmitting said 1st supplementary message (#6) and causing the covert control-invoking value, "111111", to replace the standard control-invoking value of the execute-conditional-overlay-at-205

information at those selected subscriber stations that are preprogrammed with decryption key J, the "Wall Street Week" program originating studio can invoke the aforementioned conditional-overlay-at-205 instructions at said selected stations not just once but many time by transmitting execution segments that are "111111" before transmitting said 2nd supplementary message (#6) and causing the standard control-invoking value of said execute-conditional-overlay-at-205 information, "100110", to replace said covert control-invoking value at said selected stations.

FIG. 4 shows the Signal Processing Programming Reception and Use Regulating System that is the third feature of the present invention.

The subscriber station of FIG. 4 has capacity for receiving wireless television programming transmissions at a conventional antenna, 199, and a multi-channel cable transmission at converter boxes, 201 and 222. Said boxes, 201 and 222, are conventional cable converter boxes with capacity, well known in the art, for receiving information of a selected channel of a multiplexed multi-channel transmission and converting the selected information to a given output frequency. The selected channels whose information is received at said boxes, 201 and 222 respectively, are selected by tuners, 214 and 223 respectively, which are conventional tuners, well known in the art, each with capacity for tuning to a selected channel. Antenna, 199, and boxes, 201 and 222, transmit their received information to matrix switch, 258, which is a conventional matrix switch, well known in the art, with capacity for receiving multiple inputs and outputting said inputs selectively to selected output apparatus. One apparatus that said switch has capacity for outputting to is television tuner, 215. However, the configuration FIG. 4 differs from the configuration of FIGS. 1 and 3 in that television tuner, 215, outputs its audio and video outputs to said matrix switch, 258, rather than to monitor, 202M, and divider, 4, respectively. Instead, in FIG. 4, it is said switch, 258, that outputs the information that is input to said monitor, 202M, and divider, 4. FIG. 4 shows five additional devices--three decryptors, 107, 224 and 231, a signal stripper, 229, and a signal generator, 230--associated with matrix switch, 258. Decryptors, 107, 224 and 231, are conventional decryptors, well known in the art, with capacity for receiving encrypted digital information, decrypting said information by means of a selected cipher algorithm and a selected cipher key, and outputting the decrypted information. Signal stripper, 229, is a conventional signal stripper, well known in the art, with capacity for receiving a transmission of video information, removing embedded or otherwise inserted signal information selectively, and outputting the transmission absent the removed information. Signal generator, 230, is a conventional signal inserter, well known in the art, with capacity for receiving a transmission of video information, embedding or otherwise inserting signal information selectively, and outputting the transmission with the embedded or otherwise inserted information. Matrix switch, 258, has capacity for outputting selected inputted transmissions to each said five devices, and each of said devices processes its inputted information in its specific fashion and outputs its processed information to said switch, 258.

As FIG. 4 shows, signal processor, 200, controls all the aforementioned apparatus. Signal processor, 200, controls the tuning of tuners, 214, 215, and 223; controls the switching of matrix switch, 258; supplies cipher algorithm and cipher key information to and controls the decrypting of decryptors, 107, 224 and 230; controls signal stripper,

229, in selecting transmission locations and/or information to strip and in signal stripping; and controls signal generator, 230, in selecting transmission locations at which to insert signals, in generating specific signals to insert, and in inserting.

In addition, FIG. 4 also shows divider, 4, monitor, 202M, decoder, 203, and microcomputer, 205, all of which function and are controlled as in FIGS. 1 and 3.

Finally, FIG. 4 shows local input, 225, well known in the art, which has means for generating the transmitting control information to controller, 20, of signal processor, 100. The function of local input, 225, is to provide means whereby a subscriber may input information to the signal processor of his subscriber station, thereby controlling the functioning of his personal signal processor system is specific predetermined fashions that are described more fully below, In the preferred embodiment, local input, 225, is actuated by keys that are depressed manually by the subscriber in the fashion of the keys of a so-called touch-tone telephone or the keys of a typewriter (or microcomputer) keyboard. As FIG. 4 shows, microcomputer, 205, also has capacity for inputting control information to microcomputer, 205, via decoder, 203, and in the preferred embodiment, microcomputer, 205, may also automatically substitute for local control, 225, in predetermined fashions in inputting control information to said controller, 20, on the basis of preprogrammed instructions and information previously inputted to said microcomputer, 205.

Operating S. P. Regulating Systems . . . Example #7

Example #7 illustrates the operation of the signal processing regulating system of FIG. 4 and demonstrates the interaction of the aforementioned first and third features of the present invention--the capacity to compute station specific information at each subscriber station and the system of regulating (and metering) means and methods that is illustrated in FIG. 4.

In example #7, the program originating studio that originates the "Wall Street Week" transmission transmits a television signal that consists of so-called "digital video" and "digital audio," well known in the art. Prior to being transmitted, the digital video information is doubly encrypted, by means of particular cipher algorithms A and B and cipher keys Aa and Ba, in such a way that said information requires decryption at subscriber stations in the fashion described below. The digital audio is transmitted in the clear. Said studio transmits the information of said program to a plurality of intermediate transmission stations by so-called "landline" means and/or Earth orbiting satellite transponder means, well known in the art.

Each of said intermediate transmission stations receives the transmission originated by said studio and retransmits the information of said transmission to a plurality of ultimate receiver stations.

In example #7, the intermediate station that retransmits "Wall Street Week" program information to the subscriber station of FIG. 4 is a cable television system head end (such as the head end of FIG. 6). Prior to retransmission, said station encrypts the digital audio information of said transmission, in a fashion well known in the art, using particular

cipher algorithm C and cipher key Ca, then transmits the information of said program on cable channel 13, commencing at a particular 8:30 PM time on a particular Friday night.

In example #7, the controller, 20, of the signal processor, 200, of FIG. 4 is preprogrammed at a particular time with particular information that indicates that the subscriber of said station wishes to view said "Wall Street Week" program when transmission of said program on cable cable 13 commences.

(So preprogramming controller, 20, can occur in several fashions. For example, prior to a particular time, a subscriber may enter particular please-fully-enable-WSW-on-CC13-at-particular-8:30 information at local input, 225, and cause said information, in a predetermined fashion, to be inputted to controller, 20, by local input, 225. Alternately, microcomputer, 205, can ~~control all local equipment~~be preprogrammed with particular specific-WSW ~~and manage local presentations in any fashion feasible given the nature of the local equipment and the programing.~~information and, in a predetermined fashion that is described more fully below, caused to input said please-fully-enable-WSW-on-CC13-at-particular-8:30 information to said controller, 20.)

Receiving any given instance of please-fully-enable-WSW-on-CC13-at-particular-8:30 information causes controller, 20, in a predetermined fashion, to select particular WSW-on-CC13-at-particular-8:30 information in said received information, record said selected information at particular memory, and execute particular receive-authorizing-info-at-appointed-time instructions.

In a predetermined fashion, executing said instructions causes controller, 20, causes prepare to receive a particular enabling SPAM message at a particular time. Automatically, controller, 20, checks the time of the clock, 18, of signal processor, 200, periodically. At a particular commence-enabling time that is a predetermined interval prior to the aforementioned 8:30 PM time (when said originating studio commences transmitting the "Wall Street Week" program), controller, 20, causes all apparatus of the TV signal decoder, 30, to delete from memory all information of received SPAM information; transmits particular preprogrammed enable-next-program-on-CC13 information to the control processor, 39J, of said decoder, 30, and causes said control processor, 39J, to place one instance of said information at a particular controlled-function-invoking information location; causes the oscillator, 6, then to cause switch, 1, and mixer, 3, to select information of a particular master cable control channel (that may or may not be cable channel 13) from the multi-channel cable system transmission inputted to signal processor, 200, and to input said selected to TV signal decoder, 30; causes said control processor, 39J, to cause digital detectors, 34, 37, and 38, to cease inputting detected information to controller, 39, and commence discarding said information (which said detectors, 34, 37, and 37, have capacity to do) and to cause particular apparatus of decoder, 30,--for example, line receiver, 33, and digital detector, 34--to commence receiving and inputting to controller, 39, SPAM information detected in the frequency inputted to decoder, 30; causes said control processor, 39J, to commence waiting to receive the header information of a SPAM message; and places one instance of said enable-next-program-on-CC13 information at a particular

controlled-function-invoking-@20 information location.

In the interval between said commence-enabling time and said 8:30 PM time, said head end is caused, in a predetermined fashion, to transmit a particular enabling SPAM message that consists of a "01" header, execution segment information that matches said enable-next-program-on-CC13 information, particular meter-monitor information, information segment information of particular enable-CC13 instructions and particular enable-WSW instructions that include particular enable-WSW-programming information, and an end of file signal on the frequency of said master control channel. (Hereinafter said message is called the "local-cable-enabling-message (#7).")

In the fashions described above, so transmitting said SPAM message causes signal processor, 200, at decoder, 30, (to which said master control channel is inputted), to detect the information of said message, select the information of the execution segment in said message, and determine that said selected information matches the aforementioned instance of enable-next-program-on-CC13 information at s id particular controlled-function-invoking information location. So determining a match causes the control processor, 39J, to execute particular preprogrammed transfer-this-message-to-controller-20 instructions that are associated with the instance of information at said particular location.

The matrix switch, 39I, of the controller, 39 of decoder, 30, has capacity to transfer information to controller, 20, via control transmission means and executing said instructions causes said control processor, 39J, to cause the transfer of the information of said message to controller, 20, in the fashion in which information of first message of example #4 is transferred from control processor, 39J, and buffer, 39E (by way of EOFS valve, 39F), via matrix switch, 39I, to decryptor, 39K.

Receiving said message causes controller, 20, to load the enable-CC13 instructions and the enable-WSW instructions of the information segment of said message at particular RAM of controller, 20, and execute said instructions as the machine language instructions of one job. Automatically, controller, 20, selects the information of the execution segment in said message, determines that said selected information matches the aforementioned instance of enable-next-program-on-CC13 information at said particular controlled-function-invoking-@20 information location, executes particular preprogrammed load-and-run-@20 instructions that are associated with the instance of information at said particular location, loads the information of the information segment of said message--which information is said enable-CC13 instructions--at said RAM, and executes the information so loaded. (The process of so receiving, loading, and executing the information of said message proceeds at controller, 20, in the fashion of the receiving, loading, and executing the information of the aforementioned 1st supplementary message (#6) at the apparatus of the controller, 39, of decoder, 203, following the transfer of the converted information of said 1st supplementary message (#6) by the processor, 39D, of said controller, 39.)

Executing said enable-CC13 instructions at controller, 20, in this fashion, causes controller, 20, to sample selected preprogrammed SPAM information of the station of FIG. 4 and determine whether unauthorized tampering has occurred at said station. Automatically, in the predetermined fashion of the said instructions, controller, 20, selects

information of the unique digital code at ROM, 21, that identifies signal processor, 200, and the subscriber station of FIG. 4 uniquely; computes the quotient that results from dividing said selected information by 65,536 (which is 2 raised to the 16th power); selects the integer portion of said quotient; branches, in a branching fashion well known in the art, to a selected one of a plurality of subroutines of said enable-CC13 instructions on the basis of the value of said integer; and executes said selected one subroutine. Executing said subroutine causes controller, 20, in a predetermined fashion, to select information of a particular sixteen contiguous bit locations that contain information of said enable-CC13 instructions and compare said selected information to selected information of a particular sixteen contiguous bit locations that hold preprogrammed SPAM operating information. (Said contiguous bit locations that hold preprogrammed SPAM operating information may be bit locations at any signal processing RAM or ROM at the station of FIG. 4, such as, for example, the RAM of controller, 20; the RAM of controller, 12; the RAM associated with the control processor, 39J, of decoder, 203; the RAM associated with the processor, 39B, of the decoder, 30, of signal processor, 200; etc.) A match indicates that said sixteen contiguous bit locations that hold preprogrammed SPAM operating information are preprogrammed with properly. A match occurs at the station of FIG. 4.

(Simultaneously other stations compare information of other selected information of bit locations that contain information of said enable-CC13 instructions with information of other local bit locations that hold preprogrammed SPAM operating information. At each station where a match fails to occur--which suggests that the preprogrammed SPAM operating information of said station has been tampered with in an unauthorized fashion--not resulting in a match causes the controller, 20, of said station to cause all information of said local-cable-enabling-message (#7) to be erased from all memory of said station except for a particular portion of said enable-CC13 instructions loaded at the RAM of said controller, 20, then to execute the information of said portion as information of a so-called "machine language job". Erasing said information from memory prevents the apparatus of said station from decrypting the encrypted information of said "Wall Street Week" program, and executing said portion causes said controller, 20, to cause the auto dialer, 24, and telephone connection, 22, to establish telephone communications with a particular predetermined remote station, in the fashion described above in "Operating Signal Processor Systems . . . Signal Record Transfer," and causes controller, 20, then to transmit information of the aforementioned unique digital code at ROM, 21, that identifies said station and signal processor, 200, of said station uniquely as well as particular predetermined appearance-of-tampering information. Transmitting said unique code and appearance-of-tampering information enables apparatus at said remote station to identify said remote station. If telephone communications are not established with said remote station in a predetermined fashion and/or within a predetermined time interval, executing said portion causes said controller, 20, to erase all preprogrammable RAM and EPROM of the signal processing apparatus at said station, thereby disabling said apparatus.)

Resulting in a match causes controller, 20, to execute a particular portion of said enable-CC13 instructions.

Executing the instructions of said portion causes controller, 20, in the predetermined fashion of the said portion, to cause selected apparatus of

the station of FIG. 4 to receive the cable channel 13 transmission, to cause selected apparatus to decrypt the audio portion of said transmission, to cause selected apparatus to commence waiting to receive further enabling information, and to create a meter record that documents the decryption of the cable audio transmission at the station of FIG. 4. Automatically, controller, 20, causes matrix switch, 258, to cease transferring video and audio information to monitor, 202M. Then, automatically, controller, 20, causes a selected tuner, 214, to tune to the frequency of cable channel 13, thereby causing its associated converter box, 201, to convert its received information of said frequency (which information is received by means of its multi-channel cable system transmission input) to a selected output frequency and transfer said information at said frequency to matrix switch, 258. (Said selected tuner, 214, said selected frequency, and all other apparatus and/or modes of operation selected by controller, 20, under control of the information of said information segment are selected in predetermined fashions.) Automatically, controller, 20, causes matrix switch, 258, to transfer the information inputted from said box, 201, to the output that outputs to television tuner, 215, and causes said tuner, 215, to tune to said selected frequency, thereby causing said tuner, 215, to receive the information of cable channel 13 and output the audio and video portions of said information to matrix switch, 258, on the separate audio and video outputs of said tuner, 215. Automatically, controller, 20, causes matrix switch, 258, to transfer the information of said audio portion inputted from said tuner, 215, to the output that outputs to a selected decryptor, 107, thereby causing said decryptor, 107, to receive the information of said audio portion (said information being, as explained above, encrypted digital audio). Automatically, controller, 20, selects information of cipher key Ca from among the information of said portion; transfers said cipher key information to decryptor, 107; and causes decryptor, 107, to commence decrypting its received audio information, using said key information and selected decryption cipher algorithm C, and outputting decrypted information of the audio portion of the "Wall Street Week" program transmission to matrix switch, 258. Automatically, controller, 20, causes matrix switch, 258, to transfer the information inputted from decryptor, 107, to the output that that outputs to signal processor, 200, thereby causing signal processor, 200, to receive said information at a particular third alternate contact of switch, 1, (that is not shown in FIG. 2). Automatically, controller, 20, clears all information of any prior SPAM message from decoder, 30; causes switch, 1, to connect to said third contact, thereby inputting said information to mixer, 3; and causes mixer, 3, (by control transmission means via oscillator, 6) to transfer said information without any modification; causes the control processor, 39J, of decoder, 30, to cause the filter, 31, and modulator, 32, to transfer said information without any modification; causes said control processor, 39J, to cause digital detectors, 34 and 37, to cease inputting detected information to controller, 39, and commence discarding said information and to cause digital detector, 38, to commence inputting detected information to controller, 39; and causes said control processor, 39J, to commence waiting to receive the header information of a SPAM message. Then automatically, said enable-CC13 instructions cause controller, 20, to execute said enable-WSW instructions.

Executing said enable-WSW instructions causes controller, 20, to cause the control processor, 39J, of said decoder, 30, to place one instance of said enable-WSW-programming information (that said enable-WSW

instructions include) at the particular controlled-function-invoking information location occupied by said enable-next-program-on-CC13 information (thereby overwriting said information), and said instruction cause controller, 20, to places one instance of said enable-WSW-programming information at the particular controlled-function-invoking-@20 information location occupied by said enable-next-program-on-CC13 information (thereby overwriting said information at said location, too).

Finally, controller, 20, completes execution of all information of the information segment of local-cable-enabling-message (#7) loaded at controller, 20, then in the fashion of the first message of example #4, controller, 20, processes automatically the information of the meter-monitor segment as meter information, causes a meter record of prior programming to be transferred from buffer/comparator, 14, and recorded at recorder, 16, (and causes the aforementioned signal record transfer sequence if recorder, 16, equals or exceeds if predetermined level of fullness); causes information of the meter-monitor segment to be placed at particular locations of buffer/comparator, 14, thereby creating a meter record that records the decryption of the audio portion of the "Wall Street Week" program transmission; and causes monitor information to be recorded by onboard controller, 14A, if the station of FIG. 4 is preprogrammed to collect monitor information.

Subsequently, but still in the interval between said commence-enabling time and said 8:30 PM time, said program originating studio embeds in the audio portion and transmits a particular SPAM message that consists of a "01" header, execution segment information that matches said enable-WSW-programming information, particular meter-monitor information, particular 1st-stage-enable-WSW-program instructions as the information segment information, and an end of file signal. (Hereinafter said message is called the "1st-WSW-program-enabling-message (#7).")

In the fashions described above, so transmitting said SPAM message causes signal processor, 200, at the digital detector, 38, of decoder, 30, to detect the information of said message and at the control processor, 39J, to select the information of the execution segment in said message and determine that said selected information matches the aforementioned instance of enable-WSW-programming information at said particular controlled-function-invoking information location. So determining a match causes said control processor, 39J, to execute the aforementioned transfer-this-message-to-controller-20 instructions.

Executing said instructions causes said control processor, 39J, to transfer the information of said message to controller, 20, in the fashion of the local-cable-enabling-message (#7).

Receiving the "1st-WSW-program-enabling-message (#7)" causes controller, 20, to execute the aforementioned load-and-run-@20 instructions, to load the 1st-stage-enable-WSW-program instructions of the information segment at particular RAM of controller, 20, then to execute the information so loaded as the so-called machine language instructions of one so-called job.

Executing said 1st-stage-enable-WSW-program instructions causes controller, 20, in the predetermined fashion of said instructions, to affect a first stage of decrypting the video information of the "Wall Street Week" program transmission. Automatically, controller, 20, causes

the control processor, 39J, of decoder, 30, to accept no SPAM message information from the EOFS valve, 39F. Then automatically, controller, 20, selects information of the last three significant digits of the binary information of the aforementioned unique digital code at ROM, 21; computes that particular Q quantity that is 16 less than the product of multiplying the numerical information of said digits times 256 (which is 2 to the 8th power); and selects information of those particular sixteen contiguous bit locations at the RAM associated with the control processor, 39J, of decoder, 30, that commence at the first bit location that is said Q quantity of bit locations after a particular first bit location at said RAM. At the station of FIG. 4, the preprogrammed information of said sixteen contiguous bit locations is decryption cipher key Ba. (In the present invention, the preferred method of preprogramming subscriber station signal processing apparatus is to preprogram each station with all authorized information but to vary the locations of the information from station to station in accordance with station specific information that varies from station to station--for example, in example #7, Ba cipher information can be preprogrammed at eight different RAM locations and the particular location that applies at any given station that is authorized with such information relates to the last three significant digits of the unique digital code of said station in the fashion of the above Q quantity computation.) Automatically, controller, 20, transfers said decryption cipher key Ba information to a selected decryptor, 224, and causes decryptor, 224, to commence decrypting any received information, using said key information and selected decryption cipher algorithm B, and outputting decrypted information to matrix switch, 258. Automatically, controller, 20, causes matrix switch, 258, to transfer the information of the aforementioned video output inputted from said tuner, 215, to the output that outputs to decryptor, 224, thereby causing said decryptor, 224, to receive the information of said video portion (said information being, as explained above, encrypted digital video), to decrypt said information, and to transfer decrypted information of said video portion to matrix switch, 258. Automatically, controller, 20, causes matrix switch, 258, to transfer the information inputted from decryptor, 224, to the output that that outputs to signal processor, 200, thereby causing signal processor, 200, to receive said information at the aforementioned third alternate contact of switch, 1. Automatically, controller, 20, clears all information of any prior SPAM message from decoder, 30; causes mixer, 3, and the filter, 31, and the modulator, 32, of decoder, 30, to input said information to the digital detector, 38, without any modification (switch, 1, is already connected to said third contact); and causes the control processor, 39J, of decoder, 30, to commence accepting SPAM message information from EOFS valve, 39F, and record all received SPAM message information in a predetermined fashion at the RAM associated with said control processor, 39J, until an interrupt signal of EOFS-signal-detected information is received and then to process said EOFS-signal-detected information in a predetermined fashion.

In due course, but still before said 8:30 PM time, said program originating studio embeds in the video portion and transmits particular SPAM check information that is not a SPAM message and consists only of a particular check sequence of binary information followed by an end of file signal. (Hereinafter said SPAM check information is called the "1st-WSW-decryption-check (#7).") Then said program originating studio ceases transmitting a television signal of digital video and digital audio.

Receiving the binary information of said check sequence at decoder, 30, causes digital detector, 38, to detect said information and causes control processor, 39J, to record said information at the RAM associated with said control processor, 39J, in the aforementioned predetermined fashion. Then receiving said end of file signal causes EOFS valve, 39F, to transmit an interrupt signal of EOFS-signal-detected information to control processor, 39J, thereby causing said processor, 39J, to transmit a particular check-data-loaded signal to controller, 20, in the aforementioned predetermined fashion.

Receiving said check-data-loaded signal causes controller, 20, under control of said 1st-stage-enable-WSW-program instructions, to cause the control processor, 39J, of decoder, 30, to transfer to controller, 20, selected information of said check sequence of binary information and compare said selected information to selected information of said 1st-stage-enable-WSW-program instructions. A match occurs at the station of FIG. 4, indicating that decryptor, 224, is decrypting its received information correctly.

(Simultaneously other stations compare selected information of said check sequence to selected information of said 1st-stage-enable-WSW-program instructions. At each station where a match fails to occur--which indicates that a decryptor, 224, is not decrypting its received information correctly and suggests that the preprogrammed SPAM operating information of said station may have been tampered with--not resulting in a match causes the controller, 20, of said station to cause all information of said 1st-WSW-program-enabling-message (#7) to be erased from all memory of said station except for a particular portion of said 1st-stage-enable-WSW-program instructions loaded at the RAM of said controller, 20, then to execute the information of said portion as instructions of a machine language job. Executing said portion causes controller, 20, to cause the auto dialer, 24, and telephone connection, 22, of said station to establish telephone communications with a particular predetermined remote station, in the fashion described above, and causes controller, 20, then to transmit the aforementioned appearance-of-tampering information together with complete information of the unique digital code that identifies said station uniquely. If telephone communications are not established with said remote station in a predetermined fashion and/or within a predetermined time interval, the instructions of said portion cause said controller, 20, to erase all preprogrammable RAM and EPROM of the signal processing apparatus at said station, thereby disabling said apparatus.)

Resulting in a match causes controller, 20, to execute a particular portion of said 1st-stage-enable-WSW-program instructions.

Executing the instructions of said portion causes controller, 20, to cause the apparatus of the station of FIG. 4 to cease receiving and decrypting the television information of said cable channel 13 as digital video and audio, to commence receiving said television information as conventional analog television, and to prepare to receive particular embedded SPAM information at the decoder, 30, of signal processor, 200. Automatically, controller, 20, causes matrix switch, 258, to cease transferring the information inputted from said converter box, 201, to the output that outputs to television tuner, 215; to cease transferring the information inputted from decryptor, 224, to the output that outputs

to third alternate contact of switch, 1; and to commence transferring the information inputted from said converter box, 201, to the output that outputs to said third alternate contact. Automatically, controller, 20, causes mixer, 3, to select the frequency of channel 13 and input said frequency, at a fixed frequency, to TV signal decoder, 30. Automatically, controller, 20, causes decoder, 30, to cease transferring detected digital information from digital detector, 38, to controller, 39, and to commence filtering and demodulating inputted information at filter, 31, and demodulator, 32. Automatically, controller, 20, selects information of the first three of the last four significant digits of the binary information of the aforementioned unique digital code at ROM, 21; computes that particular Q quantity that is the sum of the numerical information of said three digits plus 20; and causes decoder, 30, to commencing receiving information embedded on the line Q (and only on line Q) of the inputted video at line receiver, 33, and and transferring detected digital information from detector, 34, to controller, 39. (In other words, if the binary information of said three digits is "000", decoder, 30, receives information embedded on line 20; if the binary information of said three digits is "001", decoder, 30, receives information embedded on line 21; etc.) Finally, controller, 20, completes execution of said 1st-stage-enable-WSW-program instructions then, in the fashion of the first message of example #4, processes automatically the information of the meter-monitor segment of said 1st-WSW-program-enabling-message (#7) as meter information; causes the meter record that records the decryption of the audio portion of the "Wall Street Week" program transmission to be transferred from buffer/comparator, 14, and recorded at recorder, 16, (and causes the aforementioned signal record transfer sequence if recorder, 16, equals or exceeds if predetermined level of fullness); causes information of said meter-monitor segment to be placed at particular locations of buffer/comparator, 14, thereby initiating a meter record that records the decryption of the program transmission of the "Wall Street Week" program originating studio; and causes monitor information to be recorded by onboard controller, 14A, if the station of FIG. 4 is preprogrammed to collect monitor information.

In due course, but still before said 8:30 PM time, said program originating studio commences transmitting analog television information on its transmission frequency and embeds and transmits particular SPAM message information on lines 20, 21, 22, 23, 24, 25, 26, and 27. On each line said station transmits one particular message, and the messages of said lines are addressed to apparatus at subscriber stations where the first three of the last four significant digits of the binary information of the unique digital code at the ROMs, 21, are "000", "001", "010", "011", "100", "101", "110", and "111" respectively. Each of said messages consists of a "01" header, execution segment information that matches said enable-WSW-programming information, particular meter-monitor information, particular 2nd-stage-enable-WSW-program instructions as the information segment information, and an end of file signal. Each of said messages is identical except as as regards certain differences in said 2nd-stage-enable-WSW-program instructions that are described below. Prior to being embedded and transmitted the information of each of said messages is encrypted, in the same fashion as the first message of example #4 (except that key J is used), and the encrypted information of the execution segment is identical to particular controlled-function-invoking information that instructs use decryption key J to decrypt the information of said message in the fashion of the decrypting of said second message. (Hereinafter, each of said SPAM messages is called a

"2nd-WSW-program-enabling-message (#7).") Then said program originating studio ceases transmitting analog television information.

Transmitting said message causes the line receiver, 33, of decoder, 30, to receive the embedded SPAM information of that particular 2nd-WSW-program-enabling-message (#7) that is embedded on said line Q; the detector, 34, to detect the digital information of said message; and the controller, 39, to process said information. Automatically, control processor, 39J, causes controller, 20, to cause the decryptor, 39K, of decoder, 30, to commence decrypting using decryption key J and causes decryptor, 39K, to receive the information of said message. Automatically, decryptor, 39K, decrypts the encrypted information of said message and transfers said message to EOFS valve, 39H. Automatically, EOFS valve, 39H, inputs the information of said message, unencrypted, to control processor, 39J, until the end of file signal of said message is detected. Automatically, control processor, 39J, determines that the unencrypted information of the execution segment of said message matches the aforementioned instance of enable-WSW-programming information at said particular controlled-function-invoking information location and executes the aforementioned transfer-this-message-to-controller-20 instructions.

Executing said instructions causes the transfer of the information of said message to controller, 20, in the fashion of the local-cable-enabling-message (#7).

Receiving said 2nd-WSW-program-enabling-message (#7) causes controller, 20, to execute the aforementioned load-and-run-@20 instructions, to load the 2nd-stage-enable-WSW-program instructions of the information segment at particular RAM of controller, 20, then to execute the information so loaded as the machine language instructions of one job.

Executing said 2nd-stage-enable-WSW-program instructions causes controller, 20, in the predetermined fashion of said instructions, to strip particular SPAM information from said "Wall Street Week" program transmission, to generate and insert particular information into said transmission, and to affect a second and last stage of decrypting the digital video information of the "Wall Street Week" program transmission. Automatically, controller, 20, causes the control processor, 39J, of decoder, 30, to accept no SPAM message information from the EOFS valve, 39F. Automatically, controller, 20, causes matrix switch, 258, to cease transferring the information inputted from said converter box, 201, to the output that outputs to said third alternate contact; to commence transferring the information inputted from said converter box, 201, to the output that outputs to television tuner, 215; to commence transferring the information inputted from decryptor, 224, to the output that outputs to signal stripper, 229; to commence transferring the information inputted from signal stripper, 229, to the output that outputs to signal generator, 230; to commence transferring the information inputted from signal generator, 230, to the output that outputs to decryptor, 231; and to commence transferring the information inputted from decryptor, 231, to the output that outputs to said third alternate contact of switch, 1. Automatically, controller, 20, causes signal stripper, 229, to strip information, in a fashion well known in the art, from a particular strip-designated portion of the video transmission received at said stripper, 229, and transfer the received video, without said stripped information, to matrix switch, 258. (Said stripped information may be information that would cause disabling chips,

well known in the art, to prevent microcomputer, 205, or monitor, 202M, from processing or displaying the information of said video transmission if said stripped information were present in said transmission when said transmission was received at microcomputer, 205, or monitor, 202M.) Automatically, controller, 20, selects complete information of the aforementioned unique digital code at ROM, 21, transmits said complete information to signal generator, 230, and causes said generator, 230, to insert said complete information, in a predetermined periodic fashion and in an inserting fashion well known in the art, into a particular insertion-designated portion of the video transmission received at said generator, 230, and to transfer the received video, with said inserted information, to matrix switch, 258. (By causing information that identifies the station at which encrypted information is decrypted to be so inserted, the present invention makes it possible to identify particular stations where their information is misused--for example, if pirated decrypted copies of information are distributed, the station at which decryption occurred can be identified by means of the inserted information--and by causing said information to be inserted and then processed at a decryptor as if said inserted information were encrypted, the present invention renders the inserted information into a form that can easily be rendered back into clear form--for example, by using the same cipher algorithm and cipher key to "encrypt" said information into its predecryption form--while rendering said inserted information into a form that others, such as pirates, can find very difficult to distinguish from other binary information, to locate or identify and, therefore, to remove.) Automatically, controller, 20, selects information of the aforementioned first three of the last four significant digits of the binary information of the aforementioned unique digital code at ROM, 21 and computes a particular Q quantity according to a particular formula that is preprogrammed in said 2nd-stage-enable-WSW-program instructions. The information of said Q quantity is the decryption key Aa. (The formulas in each of the eight different 2nd-WSW-program-enabling-message (#7) messages differ from each other in such a way that when each station computes its own Q quantity according to its own first three of last four significant unique digital code digits, the Q quantities computed all properly preprogrammed and functioning stations are identical--for example, at stations where said three digits are "000" can compute by a formula that instructs said stations to add binary information of 9999 to the information of said three digits to compute the quantity Q while stations where said three digits are "001" can compute by a formula that instructs said stations to add binary information of 10000 to the information of said three digits to compute the quantity Q, etc.) Automatically, controller, 20, clears all information of any prior SPAM message from decoder, 30; causes mixer, 3, and the filter, 31, and the modulator, 32, of decoder, 30, to input said information to the digital detector, 38, without any modification (switch, 1, is already connected to said third contact); and causes the control processor, 39J, of decoder, 30, to commence accepting SPAM message information from EOFS valve, 39F, and record all received SPAM message information in a predetermined fashion at the RAM associated with said control processor, 39J, until an interrupt signal of EOFS-signal-detected information is received and then to process said EOFS-signal-detected information in a predetermined fashion.

In due course, but still before said 8:30 PM time, said program originating studio encrypts and transmits, in its digital video transmission, particular SPAM check information that consists of a

particular check sequence of binary information followed by an end of file signal (and is not a SPAM message). (Hereinafter said SPAM check information is called the "2nd-WSW-decryption-check (#7).")

As with the 1st-WSW-decryption-check (#7), receiving the 2nd-WSW-decryption-check (#7) causes control processor, 39J, to record the information of the check sequence of said 2nd-WSW-decryption-check (#7) at the RAM associated with said control processor, 39J, then to transmit a particular check-data-loaded signal to controller, 20.

Receiving said signal causes controller, 20, under control of said 2nd-stage-enable-WSW-program instructions, to cause said control processor, 39J, to transfer to controller, 20, selected information of said check sequence; to compare said selected information to selected information of said 2nd-stage-enable-WSW-program instructions; and to determine that a match results, indicating that decryptors, 224 and 231, are decrypting received information correctly. Determining a match causes controller, 20, to determine, in a predetermined fashion, that signal stripper, 229, is correctly stripping information from the aforementioned strip-designated portion of the video transmission and transferring received video without said stripped information and that signal generator, 230, is correctly inserting complete information of the aforementioned unique digital code into the aforementioned insertion-designated portion of the video transmission and transferring received video with said inserted information.

(Simultaneously other stations compare selected information of said check sequence to selected information of said 2nd-stage-enable-WSW-program instructions and verify the correct functioning of local signal strippers, 229, and generators, 230. At each station where a controller, 20, determines that a match does not result--which indicates that a decryptor, 224 or 231, is not decrypting its received information correctly and suggests that the preprogrammed SPAM operating information of said station may have been tampered with--or determines that a stripper, 229, or a generator, 230, fails to function correctly, so determining match causes said controller, 20, to cause all information of said 2nd-WSW-program-enabling-message (#7) to be erased from all memory of said station except for a particular portion of said 2nd-stage-enable-WSW-program instructions loaded at the RAM of said controller, 20, then to execute the information of said portion as instructions of a machine language job. Executing said portion causes said controller, 20, to cause the auto dialer, 24, and telephone connection, 22, of said station to establish telephone communications with a particular predetermined remote station, in the fashion described above, and causes said controller, 20, then to transmit the aforementioned appearance-of-tampering information together with complete information of the unique digital code that identifies said station uniquely. If telephone communications are not established with said remote station in a predetermined fashion and/or within a predetermined time interval, the instructions of said portion cause said controller, 20, to erase all preprogrammable RAM and EPROM of the signal processing apparatus at said station, thereby disabling said apparatus.)

Determining that signal stripper, 229, and that signal generator, 230, are stripping and inserting correctly (after having determined that that decryptors, 224 and 231, are decrypting correctly) causes the controller, 20, of the station of FIG. 4 (and causes controllers, 20, at other

stations where so determining occurs) to execute particular additional 2nd-stage-enable-WSW-program instructions, and executing said instructions causes controller, 20, to cause the apparatus of the station of FIG. 4 to commence transferring the decrypted television information of the "Wall Street Week" program to microcomputer, 205, and monitor, 202M. Automatically, controller, 20, causes matrix switch, 258, to transfer the decrypted audio information inputted from decryptor, 107, to monitor, 202M, thereby causing monitor, 202M, to commence receiving said audio information and emitting sound in accordance with said audio information. Automatically, controller, 20, causes matrix switch, 258, to cease transferring the decrypted video information inputted from decryptor, 231, to the output that outputs to said third alternate contact of switch, 1, and to commence transferring said video information inputted from said decryptor, 231, to divider, 4, thereby causing divider, 4, to transfer said decrypted video information to microcomputer, 205, and to decoder, 203. Automatically, controller, 20, causes decoder, 203, to discard any previously received SPAM information; to commence detecting SPAM information in the inputted decrypted video information and waiting to receive SPAM header information; and to cause microcomputer, 205, to commence transferring the decrypted information of the transmitted video image to monitor, 202M, thereby causing monitor, 202M, to commence displaying, at its television picture tube, the information of the transmitted television image. Automatically, controller, 20, causes decoder, 30, to discard all previously received SPAM information (including all information of said 2nd-WSW-program-enabling-message (#7) and said 2nd-WSW-decryption-check (#7)); causes oscillator, 6, and decoder, 30, to commence the detecting of example (#7); and in a predetermined fashion, causes oscillator, 6, to cause switch, 1, to connect to connect its contact lever to the aforementioned first alternate contact of switch, 1.

Finally, controller, 20, completes execution of said 2nd-stage-enable-WSW-program instructions then processes the information of the meter-monitor segment of said message as meter information; causes selected information of said meter-monitor segment to be placed at particular locations of buffer/comparator, 14, thereby incrementing the information of the aforementioned meter record that records the decryption of the program transmission of the "Wall Street Week" program originating studio; and causes monitor information to be recorded by onboard controller, 14A, if the station of FIG. 4 is preprogrammed to collect monitor information.

In due course, at said 8:30 PM time, said program originating studio commences transmitting the programming information of said "Wall Street Week" program, thereby causing the apparatus of the station of FIG. 4 (and of other correctly regulated and connected stations) to commence functioning in the fashions described above in "One Combined Medium" and in examples #1, #2, #3, and #4.

It is obvious to one of ordinary skill in the art that the foregoing is presented by way of example only and that the invention is not to be unduly restricted thereby since modifications may be made in the structure of the various parts without functionally departing from the spirit of the invention. For example, the decryption cipher key information and/or algorithm instructions and/or the location or locations of said key information and/or instructions may be computed in other, more complex or less complex, fashions. And for example, the

transmitted programming may be processed through fewer than three steps of decryption or more than three. And for example, the "Wall Street Week" transmission may be of conventional analog television, and the decryptors, 107, 224, and 231, may be conventional descramblers, well, known in the art, that descramble analog television transmissions and are actuated by receiving digital key information. And for example, determining that a local station is not preprogrammed properly and/or that decryption, stripping, and/or signal generating apparatus are not functioning correctly may cause apparatus of said station to perform other steps of disabling and/or communicating--e.g., the local apparatus may disable local apparatus selectively and only partially by, for example, preventing a decoder, 203, from processing embedded SPAM combining synch commands and may interrogate remote station apparatus, by telephone, for cipher key and/or cipher algorithm instructions and information. And for example, the transmitted programming may be caused, in a predetermined fashion to be recorded at an apparatus such as a properly configured video recorder rather than being played and displayed at a monitor, 202M. And for example, the transmitted programming may be only audio (for example, of a radio transmission) or print (for example, of broadcast print) rather than television. And for example, the output apparatus may be speakers or one or more printers rather than a television monitor. And for example, rather than being a transmitter at a remote wireless or cable transmission station, the source of the transmission may be a local apparatus such as a video (or audio or digital information) tape recorder or a laser disc player, well known in the art, that transmits a transmission of conventional rerecorded programming that has been encrypted (either fully or partially) and in which SPAM regulating instructions and information have been appropriately prerecorded which transmission is inputted to matrix switch, 258, from said local apparatus and which SPAM regulating instructions cause the decryption of the encrypted programming in the fashions of the present invention. And for example, covert control means may be used to control any regulating process of the present invention.

Monitoring Receiver Station Reception and Operation

FIG. 5 illustrates means and methods for monitoring receiver station reception and use of programming and modes of receiver station operation and exemplifies one embodiment of a subscriber station that is preconfigured and preprogrammed to collect monitor information. The means and methods facilitate the collection of statistics that identify not only what programming is received and displayed at given subscriber stations but also, for example, which local apparatus receives programming and which displays programming, how received programming is processed, what local apparatus is controlled in the course of processing and how, what locally preprogrammed data is processed by or with the received programming, which local apparatus is caused to transmit programming, etc. Efficient collection of such statistics enables suppliers of programming and of subscriber station apparatus to identify which programming subscribers demand and how subscribers use their programming and apparatus.

FIG. 5 shows a variety of input apparatus with capacity for inputting programming (including SPAM information) selectively, via matrix switch, 258, to apparatus of the subscriber station of FIG. 5, intermediate apparatus with capacity for processing and/or recording inputted programming selectively, and output apparatus for displaying or otherwise

outputting programming selectively to human senses.

Input apparatus include antenna, 199, and converter boxes, 201 and 222, that input programming transmitted from remote stations. Laser disc player, 232, and record turn table, 280, which are apparatus well known in the art, input prerecorded programming. The programming input by laser disc player, 232, in particular, may include video (as, for example, from a so-called "laser videodisc player"), digital audio (as, for example, from a so-called "compact disc player"), and digital data (as, for example, from a so-called "CD ROM"), and systems are well known in the art with capacity for playing all three forms of programming prerecorded on one given disc. Other input, 252, which may be, for example, a telephone, also has capacity for inputting programming to matrix switch, 258.

Intermediate apparatus include microcomputer, 205, radio tuner & amplifier, 213, TV tuner, 215, audio recorder/player, 255, and video recorder/player, 217, all of which are well known in the art. The station of FIG. 5 also has capacity for including one or more other tuners and/or recorder/players, 257, well known in the art, such as, for example, computer peripheral MODEMs and/or such expanded memory units as so-called "fixed disk" recorder/players.

Output apparatus that display or otherwise output programming selectively to human senses include, for example, TV monitor, 202M, multi-picture television monitor, 148, speaker system, 263, and printer, 221, all of which are well known in the art. Said apparatus that output could also include one or more other output systems, 261.

(This is only a representative group of equipment; many other types of communications and computer apparatus could be included in FIG. 5.)

Associated with each intermediate apparatus and output apparatus is one or more appropriate decoders. At radio tuner & amplifier, 138, are radio decoder, 138, and other decoder, 281. At TV tuner, 215, is TV decoder, 282. At audio recorder/player, 255, is other decoder, 284. At video recorder/player, 217, is TV decoder, 218. At microcomputer, 205, is TV decoder, 203. At other tuner and/or recorder/player, 257, is other decoder, 283. At TV monitor, 202M, is TV decoder, 145. At multi-picture TV monitor, 148, are TV decoders, 149 and 150. At speaker system, 263, is other decoder, 285. At printer, 221, is other decoder, 227. At other output system, 261, is other decoder, 286. Each decoder is likely to be located physically inside the unit of its associated intermediate or output apparatus.

At any given subscriber station, any given SPAM decoder may merely monitor the operation of its associated subscriber station apparatus or may function not only to monitor the operation of its associated apparatus but also to control said apparatus in the execution of SPAM controlled functions (in which case said decoder is preprogrammed to execute one or more controlled functions).

FIG. 5 shows each decoder as having capacity for transferring monitor information to signal processor, 200, by bus communications means. Said information is received (and processed) at signal processor, 200, by the onboard controller, 14A, which controls the communications of said bus means in a fashion well known in the art.

In FIG. 5, decoders, 138, 281, 282, 284, 218, 283, 145, 149, 150, 285, 227, and 286, merely monitor the operation of associated subscriber station apparatus. In the preferred embodiment, each one of said decoders is located at a point in the circuitry of its associated apparatus where said one receives (so as to detect all SPAM information on) the information of the selected frequency, channel or transmission to which its associated apparatus is tuned. Each one of said decoders is preprogrammed to detect and transfer to said onboard controller, 14, via said bus means, the meter-monitor information of every unencrypted SPAM message in the transmission to which its associated apparatus is tuned.

In FIG. 5, decoder, 203, which is part of the signal processor system of the station of FIG. 5, not only monitors the operation of its associated apparatus, microcomputer, 205, but also controls said apparatus, in the fashions described above, in the execution of SPAM controlled functions. Decoder, 203, has means for detecting SPAM information in any programming transmission inputted to its associated apparatus, microcomputer, 205, and not only for detecting and transferring to said onboard controller, 14, via said bus means, the meter-monitor information of every unencrypted SPAM message of said transmissions but also for inputting selected detected information to microcomputer, 205, and for controlling microcomputer, 205, in selected fashions. (FIG. 5 also shows that decoder, 203, has capacity for inputting detected information to signal processor, 200, and for receiving from and transferring control information to signal processor, 200.)

Any given decoder may have more or less apparatus than that shown if FIGS. 2A, 2B, or 2C. For example, each one of said decoders, 138, 281, 282, 284, 218, 283, 145, 149, 150, 285, 227, and 286, requires less apparatus than is shown in the appropriate corresponding figure, 2A, 2B, or 2C. Said decoders can be located in the aforementioned circuitry of their associated apparatus in such fashions that said decoders do not require filters, 31, and demodulators, 32 and 35, (in the case of TV signal decoders) or radio receiver circuitry, 41, (in the case of radio signal decoders) or other receiver circuitry, 45, (in the case of other signal decoders). On the other hand, decoder, 203, may have more apparatus that that shown in FIG. 2A. FIG. 7D, which is described more fully below, shows that a microcomputer, 205, can be controlled by SPAM information embedded in transmissions other than television transmissions. Thus, because the particular decoder that controls a particular associated apparatus will be configured and preprogrammed to detect SPAM information in every transmission that can be inputted to and control said apparatus, the decoder, 203, associated with microcomputer, 205, may be modified to constitute an "All Signal Decoder" through the addition of additional apparatus such as the radio receiver circuitry, 41, radio decoder, 42, and digital detector, 43, of the Radio Signal Decoder of FIG. 2B and the other receiver circuitry, 45, and digital detector, 46, of the Other Signal Decoder of FIG. 2C, said additional apparatus operating under the control of the controller, 39, of said decoder, 203, and inputting detected digital information to the buffer, 39A, of said controller, 39.

If a given intermediate or output apparatus can receive transmissions from more than one source or of more than one kind--television, radio, or other--it will have sufficient apparatus to monitor every channel and kind of transmission it can receive. For example, FIG. 5 shows

multi-picture TV monitor, 148, that has capacity to receive two inputted transmissions and has two TV decoders, 149 and 150. In the preferred embodiment, one decoder, 149, is located at a point in the circuitry of monitor, 148, where said decoder, 149, receives the information of one inputted transmission; the other decoder, 150, is located at a point in said circuitry said decoder, 150, receives the information of the other inputted transmission. And for example, FIG. 5 shows radio tuner & amplifier, 213, that also has capacity to receive two inputted transmissions and has two decoders: radio decoder, 138, and other decoder, 281. In the preferred embodiment, one decoder, 138, is located at a point in the circuitry of tuner & amplifier, 213, where said decoder, 138, receives information of one inputted transmission (e.g., the selected radio frequency that is the particular frequency, of the spectrum of wireless frequencies received at antenna, 199, and inputted via switch, 258, that is the frequency that the radio tuner of tuner & amplifier tunes to); the other decoder, 281, is located at a point in said circuitry where said decoder, 281, receives the information of the other inputted transmission (e.g., the output frequency of record turn table, 280, inputted via said switch, 258).

The onboard controller, 14A, controls the operation of all the decoders that merely monitor the operation of associated subscriber station apparatus and also controls other particular apparatus of the subscriber station of FIG. 5 in particular monitor information functions. FIG. 5 shows that signal processor, 200, (at onboard controller, 14A) has bus communications means for communicating control information to the aforementioned decoders, 138, 281, 282, 284, 218, 283, 145, 149, 150, 285, 227, and 286. By such bus means, onboard controller, 14A, can cause any on or all of said decoders to commence or cease processing and transmitting SPAM monitor information and can cause any one or all of said decoders to change the location or locations that are searched for SPAM information. FIG. 5 shows that, via said bus communications means, signal processor, 200, has capacity for for communicating control information (from onboard controller, 14A) to subscriber station player apparatus that has capacity for playing prerecorded programming (and in so doing, originating transmission at said station of said programming). Said player apparatus includes laser disc player, 232, record turn table, 280, audio recorder/player, 255, video recorder/player, 217, and other recorder/player, 257. Each of said player apparatus has capacity, under control of onboard controller, 14A, for generating, embedding in programming transmissions, and transmitting source mark information that identifies (and distinguishes from one another) each one of said player apparatus. By causing said player apparatus to transmit identifying source mark information, onboard controller, can cause local apparatus to collect monitor information that identifies which local player apparatus is the source of any given output of a locally originated, prerecorded programming transmission.

But the onboard controller, 14A, does not control the operation of those decoders that control the operation of subscriber station apparatus in the execution of SPAM controlled functions. Instead, all decoders that execute SPAM controlled functions are controlled, even in monitoring the operation of their associated apparatus, by the controller, 20, of signal processor, 200. In FIG. 5, decoder, 203, is the only such decoder with capacity to execute SPAM controlled functions. As FIG. 5 shows, decoder, 203, and signal processor, 200, (at onboard controller, 14A) have no capacity to communicate with with each other via the aforementioned bus

communications means for communicating control information. Rather decoder, 203, communicates control information directly with the controller, 20, of signal processor, 200, as in FIG. 3. (In respect to a decoder and other apparatus that are controlled by a controller, 20, the onboard controller, 14A, of the signal processor, 200, of said controller, 20, is preprogrammed to input to said controller, 20, all monitor instructions addressed to said decoder or associated apparatus, and said controller, 20, is preprogrammed to receive said instructions and transfer said instructions to said decoder or associated apparatus appropriately in accordance with the priority of the operation of said decoder or associated apparatus.)

Decoders that execute SPAM controlled functions are controlled in regard to monitoring by controller, 20, rather than onboard controller, 14A, because timely execution of controlled functions (and the transmission of control information related to such execution such as, for example, decryption key information as in example #4 above) has far higher priority that the collection of monitor information.

One particular advantage of these methods for monitoring programming is that, by embedding the SPAM information in the audio and/or video and/or other parts of the programming that are conventionally recorded by, for example, conventional video cassette recorders, these methods provide techniques for gathering statistics on what is recorded, for example, on video and audio cassette recorders and on how people replay such recordings. For example, a subscriber might instruct video recorder/player, 217, automatically to record the NBC Network Nightly News as broadcast over station WNBC in New York City. Recorder, 217, might receive the programming over Manhattan Cable TV channel and record the programming at the time of original broadcast transmission--from 7:00 PM to 7:30 PM on the evening of July 15, 1985. Each discrete bit of this information could be transmitted to the subscriber station of FIG. 5 in meter-monitor information (of a SPAM command with an appropriate execution segment such as information of the pseudo command) embedded in the transmitted programming. So embedding and transmitting said meter-monitor information would cause recorder, 217, to record said information. In addition, decoder, 218, would detect said information and transfer said information to signal processor, 200, together with appropriate source mark information, but no decoder apparatus associated with any of the aforementioned output apparatus would detect said information, causing said signal processor, 200, in a predetermined fashion to record a signal record of programming recorded at recorder, 217. (Simultaneously, the information of said programming is being displayed at the monitors, 202M, of other subscriber stations that are tuned to the frequency of said News as broadcast; decoders, 145, associated with said monitors, 202M, are detecting said embedded meter-monitor information and transmitting said information to the signal processors, 200, of said stations; and said signal processors, 200, are recording signal records of programming displayed at said monitors, 202M.) Subsequently, the subscriber might play back the recorded programming and view said programming on TV monitor, 202M, from 10:45 PM to 11:15 PM the same evening. So playing back and transmitting the recorded programming to monitor, 202M, would cause TV signal decoder, 145, to detect said meter-monitor information and transfer said information, together with appropriate source mark information, to signal processor, 131, causing said signal processor, 200, to record a signal record of said information together with date and time information of

said 10:45 PM to 11:15 PM the same evening selected from the clock, 18, of signal processor, 200.

Prerecorded, commercially distributed video and audio tapes, videodiscs, so-called "compact discs" of audio, and so-called "CD ROM" discs of data can also contain unique codes, embedded in the prerecorded programming, that identify the use and usage of said programming when said tapes or discs are played. For example, laser disc player, 232, can be a compact disc player upon which is loaded a compact disc. SPAM messages, embedded in the programming prerecorded on said disc, can contain pseudo command execution segment information and meter-monitor information that documents that said prerecorded programming is of Anton Bruckner's Symphony No. 4 as recorded by the Berlin Philharmoniker and the disc is distributed by EMI Records Ltd. on the Angel label with a particular catalog serial number. Through matrix switch, 258, the output of player, 232, is inputted to the amplifier, 213, and the output of amplifier, 213, is inputted to speaker system, 263. When player, 232, commences playing and transmitting said prerecorded programming, transmitting said programming causes other decoder, 281, and other decoder, 285, to detect said embedded messages at amplifier, 213, and speaker system, 263, respectively, and transmit said meter-monitor information to signal processor, 200, via the aforementioned bus communications means for transferring monitor information, thereby causing onboard controller, 14A, to commence retaining monitor information in a signal record that reflects the outputting of said programming and, in a predetermined fashion, to determine that the information of said record includes no information identifying a station or apparatus originating the transmission of said programming. So determining causes onboard controller, 14A, to transmit a particular transmit-source-code instruction, via the aforementioned bus communications means for transferring control information, to the local apparatus that have capacity for playing prerecorded programming, which apparatus include player, 232, and record turn table, 280. Receiving said instruction causes player, 232, and turn table, 280, each to generate, embed in its transmitted programming in a predetermined fashion, and transmit its own preprogrammed identifier code information that identifies each distinctly differently it from all other subscriber station apparatus (all of which apparatus have the capacity so to do). Causing player, 232, to transmit its distinct code causes other decoders, 281 and 285, to detect said code and transmit information of said code to signal processor, 200, causing onboard controller, 14A, to retain information of said code in said signal record, thereby adding to said record information of the apparatus originating the transmission of said programming.

In the case of any given programming that is outputted at any given output apparatus, thereby enabling a subscriber to view or hear or read or in some other way perceive the information of said programming, the onboard controller, 14A, may and probably will receive monitor information from several different sources. For example, in the case of the "Wall Street Week" program, transmitting the first and second SPAM messages of example #3 (which are not encrypted) will cause not only decoder, 203, to process the meter-monitor information of said messages and transmit the aforementioned 1st monitor information (#3) and 2nd monitor information (#3), via the monitor information bus means of FIG. 5, to onboard controller, 14A. The programming of said "Wall Street Week" program is received at tuner, 215, and displayed at monitor, 202M. Accordingly, transmitting said messages will also cause the decoder

associated with tuner, 215--decoder, 282--to detect, process, and transmit monitor information of said messages to onboard controller, 14A, that is identical to said 1st monitor information (#3) and 2nd monitor information (#3) except that the source mark information identifies decoder, 282, rather than decoder, 203. Likewise, unless the FIG. 1B information overlaid at microcomputer, 205, covers and obliterates the embedded information of said messages that is inputted from divider, 4, to microcomputer, 205, and would otherwise be transmitted to monitor, 202M, in the combined programming outputted by microcomputer, 205, (which covering and obliterating does not occur in example #3), transmitting said messages will also cause the decoder, 145, to detect, process, and transmit monitor information of said messages to onboard controller, 14A, that is also identical to said 1st and 2nd monitor information (#3) except that the source mark information identifies decoder, 145.

As described above, onboard controller, 14A, organizes its contained signal records on the basis of the different source mark information of the separate decoders of its subscriber station. Were onboard controller, 14A, preprogrammed to process monitor information just in this simple fashion, transmitting the first and second messages of example #3 would cause onboard controller, 14A, to record (and subsequently transmit to recorder, 16, then later to one or more remote stations) three separate signal records that would duplicate each other except that each would be associated with the source mark of a different decoder, 282, 203, or 145.

In the preferred embodiment, to minimize unnecessary duplication, prior to retaining monitor information in signal records, onboard controller, 14A, is preprogrammed to consolidate, in a predetermined fashion or fashions, monitor information transmissions that contain different source mark information but common "program unit identification code" information in such a way that subordinate sources are identified--which, in the "Wall Street Week" example, are tuner, 215/decoder, 282, and monitor, 202M/decoder, 145, where no combined medium functions and no SPAM controlled functions are executed--the monitor information from said sources is included, in a predetermined fashion, within the signal record information of the principal source--which source is, in the example, decoder, 203, at microcomputer, 205--in such a way that only exception information is recorded in the recorded information of the monitor information transmitted from the subordinate sources.

Automating Intermediate Transmission Stations

The signal processing apparatus outlined in FIGS. 2, 2A, 2B, 2C, and 2D, and their variants as appropriate, can be used to automate the operations of intermediate transmission stations that receive and retransmit programming. The stations so automated may transmit any form of electronically transmitted programming, including television, radio, print, data, and combined medium programming and may range in scale of operation from wireless broadcast stations that transmit a single programming transmission to cable systems that cablecast many channels simultaneously.

FIG. 6 illustrates Signal Processing Apparatus and Methods at an intermediate transmission station that is a cable television system "head end" and that cablecasts several channels of television programming. The means and methods for transmitting conventional programming are well known in the art. The station receives programming from many sources.

Transmissions are received from a satellite by satellite antenna, 50, low noise amplifiers, 51 and 52, and TV receivers, 53, 54, 55, and 56. Microwave transmissions are received by microwave antenna, 57, and television video and audio receivers, 58 and 59. Conventional TV broadcast transmissions are received by antenna, 60, and TV demodulator, 61. Other electronic programming transmissions are received by other programming input means, 62. Each receiver/modulator/input apparatus, 53 through 62, transfers its received transmissions into the station by hard-wire to a a conventional matrix switch, 75, well known in the art, that outputs to one or more recorder/players, 76 and 78, and/or to apparatus that outputs said transmissions over various channels to the cable system's field distribution system, 93, which apparatus includes cable channel modulators, 83, 87, and 91, and channel combining and multiplexing system, 92. Programming can also be manually delivered to said station on prerecorded videotapes and videodiscs. When played on video recorders, 76 and 78, or other similar equipment well known in the art, such prerecorded programming can be transmitted via switch 75 to field distribution system, 93.

In the prior art, the identification of incoming programming, however received; the operation of video player and recorder equipment, 76 and 78; and the maintenance of records of programming transmissions are all largely manual operations.

FIG. 6 shows the introduction of signal processing apparatus and methods to automate these and other operations.

In line between each of the aforementioned receiver/demodulator/input apparatus, 53, 54, 55, 56, 57, 58, 59, 60, 61, or 62, and matrix switch, 75, is a dedicated distribution amplifier, 63, 64, 65, 66, 67, 68, 69, or 70, that splits each incoming feed into two paths. One path is the conventional path whereby programming flows from each given receiver/demodulator/input apparatus, 53, 54, 55, 56, 57, 58, 59, 60, 61, or 62, to matrix switch, 75. The other path inputs the transmission of said given receiver/demodulator/input apparatus, 53, 54, 55, 56, 57, 58, 59, 60, 61, or 62, individually to signal processor system, 71. (In other words, distribution amplifier, 63, continuously inputs the programming transmission of receiver, 53, to matrix switch, 75, and separately to signal processor system, 71; distribution amplifier, 64, inputs the programming transmission of receiver, 54, to matrix switch, 75, and separately to signal processor system, 71; etc.)

At signal processor system, 71, which is a system as shown in FIG. 2D, the outputted transmission of each distribution amplifier, 63, 64, 65, 66, 67, 68, 69, or 70, is inputted into a dedicated decoder (such as decoders, 27, 28, and 29 in FIG. 2D) that processes continuously the inputted transmission of said distribution amplifier, 63, 64, 65, 66, 67, 68, 69, or 70; selects SPAM messages in said transmission that are addresses to ITS apparatus of said intermediate transmission station; automatically adds, in a predetermined fashion, source mark information that identifies said associated distribution amplifier, 63, 64, 65, 66, 67, 68, 69, or 70; and transfers said selected messages, with said source mark information, to code reader, 72. Signal processor system, 71, also has signal processor means to control signal processor system, 71, to record meter-monitor information of said message information, and to transfer recorded information to external communications network, 97.

Code reader, 72, buffers and passes the received SPAM message information, with source mark information, to cable program controller and computer, 73.

Cable program controller and computer, 73, is the central automatic control unit for the transmission station. Computer, 73, has an installed clock and is preprogrammed with information on the operating speeds and capacities of all station apparatus and the connections of said apparatus with matrix switch, 75.

Computer, 73, has capacity for maintaining records on the station's programming schedule and records on the status of operating apparatus. Computer, 73, has means for receiving input information from local input, 74, and from remote stations via telephone or other data transfer network, 98. Such input information can include the complete programming schedule of the station of FIG. 6, with each discrete unit of programming identified by its own "program unit identification code" information. Such input information can indicate when and how the station should expect to receive each program unit, when and on which channel or channels and how the station should transmit the unit, what kind of programming the unit is--e.g., conventional television, television/computer combined medium programming, etc.--and how the station should process the programming. Computer, 73, is preprogrammed to receive and record said schedule information and may record it in RAM or on an appropriate recording medium such as a magnetic disk at a disk drive. Likewise, computer, 73, is preprogrammed to maintain records of the control instructions that computer, 73, transmits to all controlled apparatus which records indicate, at any given time, the operating status of each controlled apparatus.

Computer, 73, monitors the operation of the head end station by means of TV signal decoders, 77, 79, 80, 84, and 88, each of which are shown in detail in FIG. 2A. Computer, 73, has means to communicate control information with each decoder, 77, 79, 80, 84, and 88, to instruct each how to operate and how and where to search for SPAM information. (The control system of the station of FIG. 6 may be reconfigured to have the signal processor of system, 71, control said decoders, 77, 79, 80, 84, and 88, if decryption of encrypted SPAM message information is required at said decoders.)

Computer, 73, monitors outgoing programming by means of decoders, 80, 84, and 88. By decoders, 80, 84, and 88, to select and transfer SPAM meter-monitor information and by comparing said information to information of its contained schedule records, computer, 73, can determine whether scheduled programming is being transmitted properly to field distribution system, 93, on each cable channel of the station of FIG. 6. Whenever computer, 73, detects errors, computer, 73, can execute predetermined error correction procedures which may include sounding an alarm to alert station personnel.

Computer, 73, monitors incoming programming by means of the aforementioned dedicated decoders of signal processor system, 71. By means of the SPAM message information, with source mark information, received from code reader, 72, computer, 73, determines what specific program unit has been received by each receiver, 53 through 62, and is passing in line, via each distribution amplifier, 63 through 70, to matrix switch, 75.

By comparing selected meter-monitor information of said message information with information of the programming schedule received earlier from input, 74, and/or network, 98, computer, 73, can determine, in a predetermined fashion, when and on what channel or channels the station of FIG. 6 should transmit the programming of each received program unit.

Computer, 73, has means for communicating control information with matrix switch, 75, and video recorders, 76 and 78, and can cause selected programming to be transmitted to field distribution system, 93, or recorded.

Determining that particular incoming programming is scheduled for immediate retransmission can cause computer, 73, to cause matrix switch, 75, to configure its switches so as to transfer said incoming programming to a scheduled output channel. For example, computer, 73, receives a given SPAM message that contains given "program unit identification code" information and the added source mark information of said message identifies distribution amplifier, 63. Receiving said message causes computer, 73, to determine, in a predetermined fashion, that said "code" information matches particular preprogrammed schedule information of programming that is scheduled to be retransmitted immediately upon receipt to field distribution system, 93, via cable channel modulator, 87. In its preprogrammed fashion, so determining causes computer, 73, to cause matrix switch, 75, to configure its switches so as to transfer the programming transmission inputted (via distribution amplifier, 63) to matrix switch, 75, from TV receiver, 53, to that output of matrix switch, 75, that outputs to modulator, 87.

Determining that particular incoming programming is scheduled for time deferred transmission can cause computer, 73, to cause the recording of said programming. For example, computer, 73, receives a given SPAM message that contains given "program unit identification code" information and the added source mark information of said message identifies distribution amplifier, 67. Receiving said message causes computer, 73, to determine, in a predetermined fashion, that said "code" information matches particular preprogrammed schedule information of programming that is scheduled to be recorded upon receipt and transmitted to the field system, 93, at a later time. So determining causes computer, 73, in its preprogrammed fashion, to select a video recorder/player, 76 or 78; to cause said selected recorder, 76 or 78, to turn on and record programming; and to cause matrix switch, 75, to configure its switches so as to transfer the programming transmission inputted (via distribution amplifier, 67) from television receiver, 58, to the output that leads to said selected recorder, 76 or 78. In so doing, computer, 73, causes said selected recorder, 76 or 78, to record said programming.

Determining that particular incoming programming is not scheduled for transmission can cause computer, 73, to cause station apparatus to discard the transmission of said programming. For example, computer, 73, receives a given SPAM message that contains given "program unit identification code" information and the added source mark information of said message identifies distribution amplifier, 69. Receiving said message causes computer, 73, to determine, in a predetermined fashion, that said "code" information matches no particular preprogrammed schedule information. In its preprogrammed fashion, so determining causes computer, 73, either to cause matrix switch, 75, to configure its

switches so as to transfer the programming transmission inputted (via distribution amplifier, 69) to matrix switch, 75, from TV demodulator, 61, to no output of matrix switch, 75; or to cause a selected recorder, 76 or 78, to cease recording; or both.

Computer, 73, has capacity for determining what programming is prerecorded on the magnetic tapes (or other recording media) loaded on the recorders, 76 and 78, and capacity for positioning the start points (or other selected points) of program units at the play heads of said recorders. Whenever programming is played on recorder, 76 or 78, decoder, 77 or 79 respectively, detects SPAM information embedded in the prerecorded programming played at the play heads of recorder, 76 or 78, and transmits said SPAM information to computer, 73. Said SPAM information can include not only "program unit identification code" information but also information regarding of the distance from the point on the tape at which a given SPAM message is embedded to the point on the tape where the program unit begins and ends (or to any other selected point). To position the start point (or another selected point) of a given program unit at the play heads of a given recorder, 76, computer, 73, instructs switch, 75, to configure its switches so as to transfer the transmission input from said recorder, 76, to no output. Then by instructing recorder, 76, to play and decoder, 77, to detect SPAM information in a particular location or locations, computer, 73, causes decoder, 77, to detect and transfer to computer, 73, said program unit and distance information. Receiving said information causes computer, 73, to cause recorder, 76, to stop playing; to analyze said distance information in a predetermined fashion; and to compute the precise time required to rewind to reach the start of the program unit or to move fast forward to reach the end. Then automatically, computer, 73, causes said recorder, 76, first, to start rewinding or moving fast forward then to stop after the precise time elapses.

(Such distance information can be embedded as SPAM message information segment information anywhere in the programming that SPAM information can be embedded and need not repeat continuously--one embedded signal word is sufficient for this method to work. But a method wherein only one instance of distance information is embedded in any given program unit of programming has the disadvantage of causing too much apparatus at too many stations to spend too much time searching for said instance. In the preferred embodiment, distance information is embedded in the relevant normal transmission location of its programming and occurs periodically throughout a program unit with increasing frequency as the closeness of the start or end of the programming approaches and with one instance, in television programming, occurring on the first and fourth frames and the last two frames of the programming.)

Computer, 73, has capacity for automatically organizing the locations of units of prerecorded programming on recording media such as magnetic video tapes loaded on a plurality of recorder/players to play according to a given schedule. For example, four spot commercials--program units Q, Y, W, and D--are loaded on 76 and 78. D and Q are recorded on the video tape loaded on recorder, 76, with D first. W and Y are recorded on the tape on recorder, 78, with W first. According to the schedule recorded at computer, 73, Q should play first on the cable channel modulated by cable channel modulator, 83; then subsequently Y and W should start to play simultaneously on the channels modulated by modulators, 83 and 87 respectively; then D should play on the channel modulated by modulator,

83, immediately after Y ends. Caused to organize the locations of said units to play according to said schedule, computer, 73, determines automatically, in a predetermined fashion, that units Q, Y and D should be recorded on the tape loaded on recorder, 76, with Q recorded first and D recorded immediately after Y. In a predetermined fashion, computer, 73, determines that insufficient available space exists on the tape on recorder, 76, to record Y immediately before D or on recorder, 78, to record D immediately after Y. So determining causes computer, 73, automatically to locate a place on the tape loaded on recorder, 78, that contains sufficient space for recording D. (Computer, 73, can contain records that identify how space on particular tapes is allocated or it can locate this space by playing the tapes, retaining information of "program unit identification code" and distance information prerecorded on said tapes [or the absence of such information], and analyzing said information in a predetermined fashion.) Automatically, computer, 73, verifies that the space is truly available by causing recorder, 78, to move forward or rewind to the start of the located space then to play for the duration of the space; by causing decoder, 79, simultaneously to search for embedded SPAM message information, detect said information, and transfer said information to computer, 73; and by checking the detected SPAM information in a predetermined fashion to ensure that detected meter-monitor information does not identify a program unit that is scheduled to be transmitted at a future time. Determining said located space to be available causes computer, 73, to cause recorder, 76, to move forward or rewind to the start of program unit D; to cause recorder, 78, to rewind to the start of said located space; and to cause switch, 75, to configure its switches so as to transfer the output of recorder, 76, to the input of recorder, 78. Automatically, computer, 73, then causes recorder, 76, to play and recorder, 78, to record for the duration of program unit D. Then automatically, in a predetermined fashion, computer, 73, alters the records it contains to reflect the location of unit D on recorder, 78, and that the space on the tape on recorder, 76, that program unit D had occupied is now available and may be recorded over. (Computer, 73, may automatically make available the the space on the tape on recorder, 76, that program unit D has occupied by causing recorder, 76, to rewind to the start of said space and to erase or record for the duration of D--since the output of recorder, 78, is the input to recorder, 76, and since recorder, 78, is not playing, a recording so recorded by recorder, 76, would contain no programming or SPAM information.) Program unit D is now recorded on the tape on recorder, 78, and program unit Q is the only unit on recorder, 76. Then automatically, in the locating fashion described above, computer, 73, locates an available space on the tape on recorder, 76, that is large enough for recording program units Y and D together. Computer, 73, verifies the availability of the space in the verifying fashion above. Computer, 73, causes recorder, 78, to move forward or rewind to the start of program unit Y; causes recorder, 76, to rewind to the start of the available space; and causes switch, 75, to configure its switches so as to transfer the output of recorder, 78, to the input of recorder, 76. Computer, 73, causes recorder, 78, to play and recorder, 76, to record for the duration of program unit Y. Computer, 73, causes recorder, 78, to move forward or rewind to the start of program unit D and causes recorder, 78, to play and recorder, 76, to record for the duration of program unit D. Finally, in the record keeping fashion above, computer, 73, alters its contained records to document the locations of Y and D on the tape on recorder, 76, and the availability of the spaces that Y and D have occupied on the tape on recorder, 78, for recording other programming. (The station of FIG. 6

may have, at recorders, 76 and 78, stripping and embedding apparatus such as signal strippers, 81 and 85, and signal generators, 82 and 86, and computer, 73, may cause said generator apparatus to record at particular places on the tapes loaded at recorders, 76 and 78, information of the contained records of computer, 73, that identify how space on said tapes is allocated.) In this fashion, computer, 73, causes units Y and W to be located on different recorders because said units are scheduled to be transmitted simultaneously and units Y then D to be located in sequence on the same recorder because unit D is scheduled to play on the same channel immediately after Y.

Computer, 73, has capacity for automatically playing organized scheduled program units according to its recorded station schedule. Computer, 73, may be caused to commence playing any given unit of programming previously loaded at a recorder, 76 or 78, in any of a number of different fashions. For example, a remote program originating studio can embed and transmit a SPAM message that contains particular cueing information, and receiving said message can cause controller, 73, to cause a selected recorder, 76 or 78, to commence playing a tape that has been positioned at the tape head of said recorder, 76 or 78, according to the schedule of computer, 73. Or for example, the aforementioned clock of computer, 83, may be caused, in a predetermined fashion, to transmit time information periodically, and receiving particular time information can cause controller, 73, to cause a selected recorder, 76 or 78, to commence playing said tape.

In the preferred embodiment, in the case of so-called "cut ins" to network transmissions, any given intermediate station computer, 73, is cued (that is, caused) to cut in any given local transmission of prerecorded programming (or top a given local transmission) by a SPAM message (that contains an execution segment and a meter-monitor segment that contains "program unit identification code" information of the program unit in which it is embedded) that is a cueing message and that is embedded in a given network transmission and transmitted by the program originating studio that originates the transmission of said network. In the case of sequential transmissions of more than one program unit of so-called "local origination" programming, each intermediate station computer, 73, is cued to start transmission of the first unit by a time transmission of the aforementioned clock of said computer, 73, (or in the case of a cut in to a network transmission, by a network transmitted SPAM cueing message), and the transmission of each subsequent unit is cued by such a SPAM cueing message that is embedded in the last one-half second of the programming of its predecessor program unit.

For example, in the case of the aforementioned schedule of computer, 73, units Q, Y, and D are scheduled to be cut into a particular first network transmission that is received at receiver, 53, and is transferred to field distribution system, 93, via modulator, 83. Unit W is scheduled to be cut into a particular second network transmission that is received at receiver, 58, and is transferred to field distribution system, 93, via modulator, 87.

Completing the organization of any given group of prescheduled tapes causes computer, 73, automatically to position the first organized unit or units to play according to schedule. Accordingly, completing the above described organization of any units Q, Y, W, and D causes computer, 73, automatically to cause recorder, 76, to move forward or rewind to the

start of unit Q and to cause recorder, 78, to move forward or rewind to the start of unit W.

In due course, a particular first instance of the aforementioned SPAM cueing message is embedded in said first network transmission and transmitted at the program originating studio that originates said transmission (hereinafter, said first instance is called the "first-network-cue-to-transmit-locally message (#8)") then, after an interval of time equal to the duration of the playing of unit Q passes, a particular second instance of said message is embedded at said studio and transmitted in said transmission (hereinafter, said second instance is called the "first-network-cue-to-transmit-network message (#8)").

Said first and second instances are each detected at that decoder of signal processor system, 71, that continuously processes the transmission outputted by distribution amplifier, 63, and are inputted to computer, 73, with appropriate source mark information.

Receiving said first instance causes computer, 73, under control of instructions of said schedule, to cause recorder, 76, to commence playing and to cause matrix switch, 75, to configure its switches to cease transferring the transmission received at receiver, 53, to modulator, 83, and to commence transferring the output of recorder, 76, to modulator, 83. In so doing, computer, 73, causes the cable head end station of FIG. 6 to cease transmitting said first network transmission to field distribution system, 93, and to commence transmitting the locally originated transmission of unit Q. Then receiving said second instance causes computer, 73, under control of instructions of said schedule, to cause matrix switch, 75, to configure its switches to cease transferring the output of recorder, 76, to modulator, 83, and to commence transferring the transmission received at receiver, 53, to modulator, 83, and to cause recorder, 76, to cease playing and to move forward or rewind to the start of unit Y. In so doing, computer, 73, causes the head end station of FIG. 6 to cease transmitting to field distribution system, 93, the locally originated transmission of unit Q; to recommence transmitting said first network transmission; and to prepare to play the locally originated transmission of unit Y. In this locating and playing fashion, computer, 73, can then play program units Y, W, and D according to its recorded schedule. (Because unit D is scheduled to play immediately after Y on the same channel, no SPAM cueing message causes computer, 73, to cause recorder, 76, to stop playing or matrix switch, 75, to switch another transmission to modulator, 83, until Y and D have both played.)

FIG. 6 shows particular signal processor system monitoring apparatus associated with the intermediate station of FIG. 6. In field distribution system, 93, amplifier, 94, inputs programming transmissions to signal processor system, 71, (where said transmissions are inputted to one alternate contact of the switch, 1, of the signal processor of said system, 71), and amplifier, 95, inputs programming transmissions to signal processor, 96, which permits both signal processor apparatus to monitor all programming transmitted by the cable television system head end station to field distribution system, 93, in the fashion of the signal processor, 200, of FIG. 3 in example #5. By recording all different received "program unit identification code" information in the fashion described above, said signal processor apparatus can automatically record, for each transmission channel of the station of FIG. 6, information, for example, that the U.S. Federal Communications

Commission requires broadcast station operators to maintain as station logs. And said signal processor apparatus can transmit such records of programming to remote sites via telephone or other data transfer networks, 97 and 99 respectively. In this fashion, said signal processor apparatus can automatically provide their contained records to one or more remote independent auditor stations.

In the preferred embodiment, at least two signal processors (such as the signal processor of said system, 71, and signal processor, 96) monitor the transmissions of any given transmission station. One (e.g., the signal processor of said system, 71) is at said station which permits station personnel to inspect said one and ensure that said one is operating continuously and correctly. At least one other (e.g., signal processor, 96) is located at a site within the distribution system of said station (e.g., field system, 93) that is remote from the transmission station of said site, and said is inspected and serviced by independent auditor personnel. The records of said processors are regularly caused to be transmitted to one or more remote auditing stations (e.g., by networks, 98 and 99), in the fashions described above, and computers at said stations are caused to receive said records, compare said records with each other, and record any differences between the two sets of records are recorded.

The cases of the transmission of units Q, Y, W, and D provide examples of the operation of signal processor apparatus, 71 and 96. As the aforementioned program originating studio of the aforementioned first and second network transmissions transmit programming, at said signal processor apparatus, 71 and 96, switches, 1; mixers, 3; and TV signal decoders, 30, detect SPAM message information in successive channel transmissions of the station of FIG. 6, under control of controllers, 20, and oscillators, 6, and transmit detected SPAM information to onboard controllers, 14A, causing signal records of program units transmitted at said station to be retained, recorded, and retransmitted to remote auditing stations in the fashion of example #5, above. Any SPAM message that contains meter-monitor information can cause said apparatus, 71 and 96, to detect, transmit, retain, record, and retransmit in the fashion described above. For example, a SPAM cueing message such as the aforementioned first-network-cue-to-transmit-locally message (#8) can cause not only the cut in and transmission of locally originated programming (e.g. the programming of unit Q) but also the processing of meter-monitor information. In the fashion described in example #5, at said apparatus, 71 and 96. Said message could cause said apparatus, 71 and 96, to add time information to retained signal records, thereby documenting a last instance of receiving the "program unit identification code" information contained in the meter-monitor information of said message. And embedding SPAM messages in the prerecorded programming of, for example, program unit Q that contain "program unit identification code" information that identifies unit Q can cause the station of FIG. 6 to transmit said messages in its transmission of Q, thereby causing said apparatus, 71 and 96, to detect, retain, and retransmit signal records of said "code" information which signal records serve as so-called "proof of performance" that the programming of said program unit Q was transmitted according to schedule by the station of FIG. 6.

So far this disclosure has described an intermediate transmission station that transmits conventional television programming; however, the intermediate station automating concepts of the present invention apply

to all forms of electronically transmitted programming. The station of FIG. 6 can process and transmit radio programming in the fashions of the above television programming by adding radio transmission and audio recorder/player means, each with associated radio decoder means as shown in FIG. 2B, wherever television means are shown in FIG. 6, all with similar control means to that shown in FIG. 6 and by processing radio programming with appropriately embedded signals according to the same processing and transmitting methods described above. Likewise, said station can transmit broadcast print and data communications programming by adding appropriate transmission and recorder/player means and decoder/detector means with control means and using the same processing and transmitting methods. This example has described methods at a multi-channel intermediate transmission station; the methods are also applicable in a station that transmits only a single channel of television, radio, broadcast print or data. In addition, the programming and SPAM information transmitted to intermediate transmission station can be encrypted and decrypted and monitored in the fashions described above. Intermediate transmission station apparatus can include signal processing regulating system apparatus such as the apparatus of FIG. 4 by means of which encrypted transmissions that are transmitted to intermediate stations are caused to be decrypted and metered. Intermediate transmission station apparatus can include encryptor apparatus that encrypt programming transmissions selectively. And intermediate transmission station apparatus can include signal processing monitoring system apparatus in the spirit of the apparatus of FIG. 5 whereby the availability, use, and usage of programming at selected intermediate station apparatus is recorded and records are transmitted to remote stations that process such records.

Automating Intermediate Transmission Stations . . . EXAMPLE #8

Using the capacity described above for identifying, selecting, and recording received programming; for organizing recorded programming to play according to schedule; for playing selected organized programming on schedule; and for retaining, recording, and retransmitting monitor records that document the transmission of program units, a remote distribution station can transmit to a plurality of intermediate transmission stations programming that is scheduled for delayed transmission, cause each station of said plurality automatically to select and retransmit programming according to its own specific schedule, and cause signal processing apparatus automatically to transmit to a remote auditing station or stations signal records that document the transmission of specific program units at the specific stations of said plurality.

One such remote distribution station might be, for example, a so-called "satellite uplink" that transmits programming, in a fashion well known in the art, to a plurality of receiver stations via a satellite transponder (said intermediate transmission stations being among said receiver stations). Said programming might be, for example, so-called "television spot commercials." Providing means where by one station can transmit programming to a plurality of intermediate transmission stations and cause each intermediate station to transmit its own specific selected units of said programming according to its own specific schedule enables one such distribution station such as a so-called "spot rep." agency that sells the so-called "spot time" of many, widely separated local broadcast stations and cable systems to transmit many different spot commercial

program units to said stations and systems automatically and cause each station or system automatically to retransmit its specific selected commercial program units according to its specific schedule. And providing means that document the specific program units transmitted at each specific station enables said distribution station to provide so-called "proof of performance" to parties who pay for the transmission of said spot commercials.

Example #8 illustrates a remote distribution station transmitting programming and causing apparatus at a plurality of intermediate transmission stations to operate in this fashion.

In example #8, a given remote distribution station that is located in Carteret, N.J., U.S.A. transmits television programming to a plurality of intermediate transmission stations by means of a satellite that is located approximately 20,000 miles above the Earth in so-called "geosynchronous orbit" and transmits programming to the North American continent. Among said intermediate stations are cable system head ends located in California and Florida, broadcast stations located in Texas and Washington, D.C., and the station of FIG. 6 which is, for example, in Vermont.

At each intermediate transmission station is a computer, 73, that is preprogrammed to receive, process, and record, in a predetermined fashion, program schedule information that is transmitted from said remote distribution station. And the signal processor system, 71, and the computer, 73, of each station are preprogrammed to process particular SPAM message instructions are transmitted from said remote distribution station.

At a particular time on a particular day--for example, at 5 P.M. eastern standard time, on Jan. 27, 1988--said remote distribution station commences contacting, individually and in turn in a fashion well known in the art, the computers, 73, of each of said intermediate station, via telephone or other data transfer network, 98 (which has capacity to communicate information individually between said remote station and each of said computers, 73). Said remote station inputs schedule information to each computer, 73. Said information identifies the particular time and date when all of said intermediate transmission stations should commence receiving a particular satellite transmission--for example, at 4 A.M. eastern standard time, on Jan. 28, 1988--and which particular satellite transponder transmission said stations should prepare to receive the programming on--for example, transponder 23 on the Galaxy 1 satellite. Said schedule information also identifies to each specific computer, 73, which specific program units, transmitted via said transponder, said computer, 73, should cause the apparatus of its station to select and record, and when and on which channel of said station said computer, 73, should cause the apparatus of said station to transmit each of said program units to the field distribution system, 93, of said station. For example, in the case of the computer, 73, of the station of FIG. 6, said remote distribution station informs said computer, 73, to select and record program units Q, D, Y, and W; to transmit program unit Q at 2:30:30 PM eastern standard time, on Jan. 29, 1988 on the cable channel transmitting the Cable News Network; to transmit program unit Y at 2:45:00 PM eastern standard time, on Jan. 29, 1988 on the cable channel transmitting the Cable News Network; to transmit program unit W at 2:45:00 PM eastern standard time, on Jan. 29, 1988 on the cable channel

transmitting the USA Cable Network; to transmit program unit D at 9:15:30 PM eastern standard time, on Jan. 30, 1988 on the cable channel transmitting the Cable News Network.

In inputting schedule information to each computer, 73, said remote distribution station instructs different computers, 73, to operate differently. For example, said remote station instructs a particular Florida computer, 73, at a cable system head end station in Florida (which computer, 73, is not the computer, 73, of the station of FIG. to select and record program units Q, J, and L; to transmit program unit J at 2:30:30 PM eastern standard time, on Jan. 29, 1988 on the cable channel of said station in Florida that transmits the Cable News Network; and to transmit units Q and L subsequently at particular times on the cable channel of said station that transmits the Spanish International Network.

Subsequently, at a particular time--more precisely, at 3:50 A.M. eastern standard time, on Jan. 28, 1988--said schedule information and particular preprogrammed receive-scheduled-programming instructions at each computer, 73, cause the computers, 73, at said intermediate transmission stations each, in a predetermined fashion, to commence preparing its particular station to receive and record information of the transmission of transponder 23 of the Galaxy 1 satellite. Automatically, at the station of FIG. 6, the computer, 73, instructs a selected earth station, 50, to move its antenna so as to receive transmissions from a satellite at the celestial coordinates of the Galaxy 1 satellite and instructs amplifier, 51, and receiver, 53, to amplify and tune as required to receive the transmission of the frequency of the transponder 23 of said satellite. (Said celestial coordinates and the transmission frequency of said transponder are preprogrammed at the computer, 73, of each of said intermediate stations, and while FIG. 6 does not show means whereby computer, 73, can control earth station, 50, amplifier, 51, and receiver, 53, said means are well known in the art and exist at each of said intermediate stations, including the station of FIG. 6.) Automatically, at the station of FIG. 6, the computer, 73, causes matrix switch, 75, to configure its switches so as to transfer transmissions from receiver, 53, to a selected primary recorder, 76; causes said recorder, 76, to turn on; and causes said recorder, 76, to move forward or rewind to a particular place on the tape loaded at its record head such as the start of the tape. Automatically, said computer, 73, also causes a selected secondary recorder, 78, to turn on and causes said recorder, 78, to move forward or rewind to a particular place on the tape loaded at its record head such as the start of the tape. (The station could include apparatus well known in the art for automatically loading tape on said recorders, 76 and 78, and control means whereby computer, 73, could instruct said apparatus to load a particular tapes selectively on recorder, 76 and 78.) Simultaneously, the computer, 73, of every other one of said intermediate stations similarly to prepare to receive and record information of the transmission of transponder 23 of the Galaxy 1 satellite.

At 4 A.M. eastern standard time, on Jan. 28, 1988 said remote distribution station commences transmitting programming by satellite up-link means, well known in the art. Said programming consists of a sequence of the program units of 26 spot commercials, each of thirty seconds duration. In succession, said station transmits units A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, and Z. Embedded in each of said program units are SPAM messages containing

appropriate "program unit identification code" information and distance information. Separating the transmission of the end of each program unit and the commencement of the succeeding unit is a brief interval of time. Before transmitting the first program unit and, subsequently, in each one of said intervals, said distribution station transmits a SPAM message that contains execution and meter-monitor segments. Each message contains the same execution segment information that is addressed to ITS computers, 73, and instructs each computer, 73, to identify the information in the meter-monitor segment of said message, to compare said "code" information to the preprogrammed schedule information of said computer, 73, and if a match results, to select and record the programming of the program unit that follows said message, or if no match results, to not select and not record said programming. Each message contains meter-monitor "program unit identification code" information of the program unit that immediately follows. (Hereinafter, said messages are called individually the "select-A-message (#8)," the "select-B-message (#8)," the "select-C-message (#8)," and so forth up to the "select-Z-message (#8)," each message referring to the corresponding program unit: A, B, C, and so forth up to Z, respectively, and said messages are called collectively the "cue-to-select messages (#8).") In the preferred embodiment, the length of each of said intervals is greater than the minimum amount of time necessary for each and every one of said intermediate stations to cause a recorder to commence recording a properly recorded recording of said programming, and said distribution station transmits each of said SPAM messages early enough before commencing to transmit its succeeding program unit to enable all intermediate stations that record said unit to record said unit completely.

Transmitting said programming and said cue-to-select messages (#8) causes signal processing system apparatus at each of said stations to detect said cue-to-select messages (#8) and input said messages to the computers, 73, of said intermediate stations. At the station of FIG. 6, said cue-to-select messages (#8) are detected and transferred to computer, 73, by that dedicated decoder of signal processing system, 71, that receives a transmission from distribution amplifier, 63.

The computers, 73, of said intermediate stations are preprogrammed to process the information of said cue-to-select messages (#8), and receiving any given one of said messages causes each computer, 73, of one of said intermediate transmission stations to determine whether the "program unit identification code" information of said one matches schedule information previously inputted to said computer, 73, by said distribution station. Determining a match causes said computer, 73, to cause apparatus of its station to record the programming of the program unit transmitted immediately after said one. Not determining a match causes said computer, 73, to cause apparatus of its station not to record said program unit.

At the computer, 73, of the station of FIG. 6, receiving the select-A-message (#8), the select-B-message (#8), and the select-C-message (#8), cause said computer, 73, not to cause recording of the programming of program units A, B, and C. Then receiving the select-D-message (#8) causes said computer, 73, to determine that the "program unit identification code" information of unit D matches preprogrammed schedule information which causes said computer, 73, to cause recorder, 76, to commence recording, thereby causing said recorder,

76, to record the programming of program unit D which follows said select-D-message (#8). Then receiving the select-E-message (#8) causes said computer, 73, to determine that the "program unit identification code" information of unit E does not match any preprogrammed schedule information which causes said computer, 73, to cause recorder, 76, to cease recording, thereby causing said recorder, 76, not to record the programming of program unit E which follows said select-E-message (#8). Subsequently, receiving the select-Q-message (#8) causes said computer, 73, to determine that the "program unit identification code" information of unit Q matches preprogrammed schedule information which causes said computer, 73, to cause recorder, 76, to commence recording, thereby causing said recorder, 76, to record the programming of program unit Q which follows said select-Q-message (#8). Then receiving the select-R-message (#8) causes said computer, 73, to determine that the "program unit identification code" information of unit R does not match any preprogrammed schedule information which causes said computer, 73, to cause recorder, 76, to cease recording, thereby causing said recorder, 76, not to record the programming of program unit R which follows said select-R-message (#8).

Each computer, 73, of said intermediate stations is preprogrammed to account for and keep track of the quantity of time available for additional recording on the individual tapes loaded on the recorders (e.g., 76 and 78) of its station, and receiving any given message of said cue-to-select messages (#8) can cause any given computer, 73, to cause the apparatus of its station to switch from a primary to a secondary recorder of said station. For example, at the station of FIG. 6, each time computer, 73, receives a SPAM message that identifies the end of a program unit that its primary recorder, 76, has been recording, said computer, 73, determines, in a predetermined fashion, whether sufficient tape recording capacity exists on said recorder, 76, to continue recording. Determining that sufficient capacity does not exist causes computer, 73, to switch the input of the received transmission of said remote distribution station to the aforementioned alternate recorder, recorder, 78. At the station of FIG. 6, receiving said select-R-message (#8) causes said computer, 73, (after causing recorder, 76, to cease recording) to cause matrix switch, 75, to configure its switches to commence transferring the transmission from receiver, 53, to recorder, 78, and to cease transferring said transmission to recorder, 76.

In due course, receiving the select-W-message (#8) causes said computer, 73, to determine that the "program unit identification code" information of unit W matches preprogrammed schedule information which causes said computer, 73, to cause recorder, 78, to commence recording, thereby causing said recorder, 78, to record the programming of program unit W which follows said select-W-message (#8). Then receiving the select-X-message (#8) causes said computer, 73, to cause recorder, 78, to cease recording, thereby causing said recorder, 78, not to record the programming of program unit X. Then, receiving the select-Y-message (#8) causes said computer, 73, to cause recorder, 78, to commence recording, thereby causing said recorder, 78, to record the programming of program unit Y. Then receiving the select-Z-message (#8) causes said computer, 73, to cease recording.

Whenever any given computer, 73, of said intermediate stations causes a recorder (e.g., 76 or 78) of its station to cease recording, said computer, 73, then checks its contained records in a predetermined

fashion to determine whether all scheduled program units have been received (and, hence, that no further units will be received). And when said remote distribution station finishes transmitting the final program unit (unit Z), said station transmits a particular final SPAM message that, in a predetermined fashion, causes any given computer, 73, whose records show that one or more program units remain unreceived to determine that no units will be received.

Whenever any given computer, 73, of said stations determines that no further units will be received, said computer, 73, causes apparatus of its station to cease receiving the transmission of said remote distribution station, alters its operating records to show that the receiver apparatus receiving said transmission is available for other use; and commences automatically organizing, in the fashions described above, the order of the program units so selected and recorded and playing said units according to its contained schedule.

At the station of FIG. 6, receiving said select-Z-message (#8) causes computer, 73, to determine that program units Q, Y, W, and D have been received and that no further units will be received. Determining that no further units will be received causes computer, 73, to cause matrix switch, 75, to configure its switches so as to transfer transmissions inputted from receiver, 53, to no output; to alter its operating records to show that the receiver apparatus receiving the transmission of said remote distribution station is no longer in use and is available; and to organize the locations of the recorded program units, D, Q, W, and Y, to play according to the schedule inputted by said distribution station in the fashion described above (in the paragraph of the section, "AUTOMATING INTERMEDIATE TRANSMISSION STATIONS," that begins, "Computer, 73, has capacity for automatically organizing the locations of units of prerecorded programming . . . to play according to a given schedule").

(In so transmitting said programming and said cue-to-select messages (#8), said remote distribution station causes different intermediate transmission stations to select and record different programming and to organize recorded program units differently. For example, transmitting the select-J-message (#8), the select-K-message (#8) the select-L-message (#8), the select-M-message (#8), the select-Q-message (#8), and the select-R-message (#8) causes signal processing apparatus at the aforementioned cable system head end station in Florida to input the aforementioned Florida computer, 73, that said distribution has instructed to select, record, and play program units Q, J, and L according to schedule. Receiving said select-J-message (#8), the select-L-message (#8), and the select-Q-message (#8) cause said Florida computer, 73, to determine that "program unit identification code" information matches preprogrammed schedule information which causes said Florida computer, 73, to cause a selected recorder of said station to commence recording, thereby causing said recorder to record the programming of program units J, L, and Q. Receiving the select-K-message (#8) and the select-M-message (#8) causes said Florida computer, 73, to determine that "program unit identification code" information does not match preprogrammed schedule information which causes said computer, 73, to cause said recorder, 76, to cease recording. And receiving the select-R-message (#8) and the select-M-message (#8) causes said Florida computer, 73, to determine that no further units will be received and to organize the locations of the recorded program units, J, L, and Q, to play according to its own schedule, previously inputted by said

distribution station.)

In due course, as described above, completing the organization of units Q, Y, W, and D causes the computer, 73, of the station of FIG. 6 automatically to cause recorder, 76, to move forward or rewind to the start of unit Q and to cause recorder, 78, to move forward or rewind to the start of unit W. (Completing the organization of units J, L, and Q causes said Florida computer, 73, automatically to cause the aforementioned recorder of its station to move forward or rewind to the start of unit J.)

At a particular time prior to 2:30 PM eastern standard time, on Jan. 29, 1988 particular preprogrammed schedule-network information and receive-scheduled-programming instructions cause the computer, 73, of the station of FIG. 6 to cause apparatus at said station to receive the transmission of the Cable Channel Network; to transmit said transmission to field distribution system, 93, via the cable channel of modulator, 83; and to commence processing monitor information embedded in said transmission. Automatically, said computer, 73, causes earth station, 50, to move its antenna so as to receive transmissions from a satellite at particular preprogrammed celestial coordinates; causes amplifier, 51, and receiver, 53, to amplify and tune as required to receive the transmission of the particular preprogrammed frequency of a particular CNN transponder of said satellite; and causes matrix switch, 75, to configure its switches so as to transfer transmissions from receiver, 53, to modulator, 83. Automatically, signal processor, 96, and the signal processor of signal processor system, 71, each commence detecting SPAM messages in said transmission and retaining and recording signal records of Cable News Network program units.

At 2:30:29 PM eastern standard time, on Jan. 29, 1988 the Atlanta, Ga. program originating studio that originates said transmission of the Cable Channel Network embeds the aforementioned first-network-cue-to-transmit-locally message (#8) in said transmission and transits said transmission to said CNN transponder. Automatically, said transponder retransmits said transmission, said transmission is received at the station of FIG. 6, and said message is inputted to computer, 73, with source mark information of distribution amplifier, 63. (Automatically, said message is also inputted to the computers, 73, of others of said intermediate transmission stations including said Florida computer, 73.)

Receiving said first-network-cue-to-transmit-locally message (#8) causes the computer, 73, of the station of FIG. 6, as described above, to cause the apparatus of said station to cease transmitting the Cable News Network transmission to field distribution system, 93, and to commence transmitting the locally originated transmission of unit Q. (Receiving said first-network-cue-to-transmit-locally message (#8) causes said Florida computer, 73, to cause the apparatus of its station to cease transmitting the Cable News Network transmission to its field distribution system and to commence transmitting the locally originated transmission of unit J.)

Because said first-network-cue-to-transmit-locally message (#8) is transmitted, via matrix switch, 73, to field distribution system, 93, at the station of FIG. 6 (and so transmitted also at the station of said Florida computer, 73) before receiving said message can cause said switch, 73, to cease transmitting said Cable News Network transmission to

said field, 93, receiving said first-network-cue-to-transmit-locally message (#8) causes the signal processor of the signal processor system, 71, and the signal processor, 96, of station of FIG. 6 to retain signal record information of the meter-monitor information of said first-network-cue-to-transmit-locally message (#8) as described above. (Receiving said message causes corresponding signal processor apparatus at the station of said Florida computer, 73, similarly to retain signal record information.)

Causing the apparatus of the station of FIG. 6 to commence transmitting the locally originated transmission of unit Q to field distribution system, 93, causes the signal processor of the signal processor system, 71, and the signal processor, 96, of station of FIG. 6 to retain signal record information of the meter-monitor information of SPAM messages embedded in the prerecorded programming of said unit Q, as described above; causes said processors (in the fashion described in example #3 above) each to record previously retained signal record information of the prior programming--i.e., programming of said Cable News Network--and may cause one or both of said processors to transmit signal record

At 2:30:59 PM eastern standard time, on Jan. 29, 1988 said program originating studio that originates said transmission of the Cable Channel Network embeds the aforementioned first-network-cue-to-transmit-network message (#8) in said transmission and transits said transmission to said CNN transponder. And automatically, said message is inputted, with source mark information, to the computer, 73, of the station of FIG. 6 (and to said Florida computer, 73).

Receiving said first-network-cue-to-transmit-network message (#8) causes the computer, 73, of the station of FIG. 6, to cause the apparatus of said station, as described above, to cease transmitting to field distribution system, 93, the locally originated transmission of unit Q; to recommence transmitting said Cable News Network transmission; and to prepare to play the locally originated transmission of unit Y. (At the station of said Florida computer, 73, receiving said first-network-cue-to-transmit-network message (#8) causes said Florida computer, 73, to cause the apparatus of said station to cease transmitting the locally originated transmission of unit J; to recommence transmitting said Cable News Network transmission; and to prepare to play the locally originated transmission of unit Q or unit L.)

Subsequently, other SPAM cueing messages cause the computer, 73, of the station of FIG. 6; said Florida computer, 73; and the computers, 73, of others of said intermediate transmission stations to locate, position to play, and transmit automatically other local origination program units. And the transmission of other SPAM messages with meter-monitor information cause the signal processors at said intermediate transmission station to retain, record, and transmit to remote auditing stations signal records that document the specific program units transmitted at each specific one of said stations.

In this fashion, a remote distribution station can deliver prerecorded programming to a plurality of intermediate transmission stations, control the automatic time-delayed insertion of specific program units of programming into other programming transmissions at specific intermediate transmission stations according to the specific schedule of each station, and cause records to be recorded and transmitted to a remote auditing

station or stations that document which specific program units were transmitted at which specific station at what specific times.

Automating Intermediate Station Combined Medium Operations . . . (Including Example #9)

The station of FIG. 6 has capacity to automatically process and transmit television-based combined medium programming such as that of the "Wall Street Week" example above. In the case of programming that is transmitted to said station with all required program instruction sets and combining synch commands already properly embedded, said station records and transmits said programming just as said station records and transmits conventional television programming.

But said station also has means for automatically generating and embedding combined medium programming control instructions in certain fashions. FIG. 6 shows signal strippers, 81, 85, and 89, of which models exist well known in the art, that computer, 73, can cause to remove SPAM information from programming as required, and signal generators, 82, 86, and 90 also well known in the art, that computer, 73, can cause to embed SPAM information as required. Said generators 82, 86, and 90, have capacity for receiving control information and programming in a transmission from computer 73, and distinguishing, in a predetermined fashion, said control information from said programming. Said strippers, 81, 85, and 89, and generators, 82, 86, and 90, have capacity for stripping or embedding SPAM information at as little as one portion of one line of one frame of a television transmission or as much as as every line of every frame and capacity to strip or insert SPAM information on a given frame at multiple, noncontiguous locations.

For sake of example program units, Q and D, above are combined medium programming of the same sort as "Wall Street Week" except that computer 73, must insert one or more particular locally generated program instruction sets into a local transmission of the programming of each of said program units. For example, program unit Q is a spot commercial of a supermarket chain that describes discounts and so-called "cents-off coupon specials" at local supermarkets. The particular formulas that apply to discounts and the particular items on special vary from specific supermarket to specific supermarket and from time to time, and the information in the embedded program instruction sets of any given transmission of unit Q must reflect the particular formulas and items that apply at specific local supermarkets at the time of said transmission.

Program units Q and D are delivered, organized to play, and played according to schedule in the automatic fashions described above but with certain variations.

Computer, 73, is preprogrammed to process combined medium programming. When the aforementioned remote distribution station inputs information to computer, 73, via network, 98, regarding unit Q, said distribution station inputs information that Q is particular combined medium programming and instructs computer, 73, to commence particular program instruction set generation in a particular fashion at a particular time interval prior to the scheduled playing of Q. (Hereinafter, a particular instance of such a time period is called "interval," as in "interval Q" of unit Q.) Inputting said information and instructions causes Computer,

73, to record said information and instructions in its record keeping fashion together with the scheduled generation time which computer, 73, calculates as the scheduled play time minus interval Q. Prior to the scheduled generation time, particular local-formula-and-item information is inputted to computer, 73, regarding the formulas and items that apply in the case of this particular transmission of Q. (In other words, said local-formula-and-item information reflects specific information such as the particular discounts and cents-off coupon specials that apply at the scheduled time of the transmission of unit Q at the particular supermarket or markets that are local to the station of FIG. 6.) Said information may be inputted from local input, 74, or over network, 98, and computer, 73, records said information in a predetermined fashion.

Computer program instructions, of the sort well known in the art, are also inputted to computer, 73, and computer, 73, is caused to execute said instructions. Executing said instructions causes computer, 73, to generate information of a program instruction set. (Hereinafter, an instance of computer program instructions that cause a computer, at an intermediate transmission station, to generate information of a program instruction set is called an "intermediate generation set.")

For example, when executed, one particular intermediate generation set that is inputted to computer, 73, causes computer, 73, in a fashion that is described more fully below, to generate particular program instruction set information of the combined medium programming of program unit Q.

Computer, 73, can receive and be caused to execute intermediate generation set information in any fashion that a computer receives and is caused to execute computer program instructions.

In the case of prerecorded programming, in the preferred embodiment, the information of any given intermediate generation set is prerecorded in a program unit with the conventional programming--for example, the conventional television or radio programming--into whose transmission is embedded the program instruction set whose generation said given intermediate set causes. And said intermediate set is prerecorded in said program unit before the start of said conventional programming. For example, in the case of television programming such as the programming of unit Q, the particular intermediate set that is inputted to computer, 73, is located on the recording medium of unit Q within the defined space of program unit Q immediately following the point at which unit Q starts and before the point at which the conventional television information of Q commences. Said intermediate generation set information is embedded in the so-called "full frame" video on each successive frame until complete information of said set information is embedded; that is, embedding of said set information commences at the first line of the normal transmission location and continues on each successive detectable line of a first frame and, continuing in this fashion, on each successive frame until all intermediate generation set information is embedded. The conventional television video and audio information of program unit Q are prerecorded in the conventional fashion, commencing at the frame immediately following the last frame in which intermediate generation set information is embedded.

Any given intermediate generation set contains generally applicable information of the particular program instruction set whose generation it causes. Generally applicable information is specific. For example, the

generally applicable information of the intermediate generation set of the programming of Q includes binary sound image information of a particular announcer's voice saying, "forty-three", "forty-five", "forty-six", "low-salt Vindaloo", "Mild version Quick", and "Hot version Quick". And any given datum of generally applicable information may be specific information only of selected subscriber stations. Yet such information is generally applicable at any given transmission station because any given datum may be applicable at any or all of the subscriber stations of said transmission station.

Said generally applicable information lacks specific information that is required to complete the generation of a given instance of a generated program instruction set. (For example, in the case of unit Q, the intermediate generation set lacks information of the particular discount formulas and items offered as cents-off coupon specials that apply at the scheduled time of the transmission of unit Q at the particular supermarket or markets that are local to the station of FIG. 6.)

When executed at a computer, 73, that is preprogrammed with particular local-formula-and-item information (that is, particular data), the instructions of a given intermediate generation set (that is, of a given computer program) cause said computer, 73, to generate particular formula-and-item-of-this-transmission information and incorporate said information into said generally applicable information of said particular program instruction set, thereby generating the particular program instruction set instance applicable to a particular transmission it a particular intermediate transmission station. The set information so generated may consist of computer program instructions and/or data.

An example #9, that focuses on generating, embedding, and transmitting combined medium program instruction set programming of unit Q at the station of FIG. 6 illustrates automating intermediate station combined medium operations.

At the aforementioned interval Q time prior to the scheduled playing of Q, particular preprogrammed preplay-and-generate instructions cause computer, 73, to commence said program instruction set generation. Said instructions cause computer, 73, to cause matrix switch, 75, to switch the input from recorder, 76, to no output; to cause recorder, 76, to position the start of unit Q at its play head; to cause decoder, 77, to commence detecting signals on all video lines from the beginning of the normal transmission pattern to the end of the last detectable line of the full video frame; then to cause recorder, 76, to commence playing which causes recorder, 76, to transmit and decoder, 77, to detect a particular SPAM message. Hereinafter, said message is called the "generate-set-information message (#9)".) Said message is addressed to ITS computers, 73, and contains a particular execution segment, appropriate meter-monitor information, padding bits as required, an information segment whose information is the intermediate generation set of Q, and an end of file signal. (Hereinafter, the intermediate generation set that causes any given intermediate transmission station to generate a program instruction set of an instance of the transmission of the programming of program unit Q is called the "intermediate generation set of Q".)

Detecting said message causes decoder, 77, to transmit said message to computer, 73, and receiving said message at computer, 73, causes

particular SPAM decoder apparatus of computer, 73, (which apparatus is analogous to SPAM controller, 205C, at microcomputer, 205, above and is not distinguished from computer, 73, hereinafter) to execute particular controlled functions. In the fashion of the first message of the "Wall Street Week" example at microcomputer, 205, computer, 73, is caused to load information of said intermediate generation set at particular RAM. Then receiving the end of file signal that ends said message causes computer, 73, to execute particular additional instructions of said controlled functions. Executing said instructions, causes computer, 73, to cause recorder, 76, to cease playing and position the start of the unit Q conventional television programming at the play head of recorder, 76; to cause decoder, 77, to commence detecting information in the normal transmission location alone; to cause stripper, 81, and generator, 82, to prepare to commence stripping and embedding information, respectively, in the normal transmission location; and to execute the information of said intermediate generation set as a compiled, machine language job.

Executing the information of said set causes computer, 73, to compute said formula-and-item-of-this-transmission information in the predetermined fashion of said intermediate generation set according to the prerecorded data of said local-formula-and-item information; to compile formula-and-item-of-this-transmission information into a machine language program module; and to link said module to other program modules of said program instruction set (which modules may include modules of the aforementioned generally applicable information of said program instruction set and may also include modules preprogrammed at computer, 73). (Formula-and-item-of-this-transmission information can be incorporated into more than one module by any given intermediate generation set.)

Said formula-and-item-of-this-transmission information can consist of both computer program instructions and data. For example, one of the aforementioned discounts and cents off coupon specials is of a 15 cents off coupon special on an offered product that varies from week to week and market to market. The information of the particular product that is offered at the particular time of the scheduled transmission at the station of FIG. 6 and at the particular supermarkets in the locality of said station is data that exist in the aforementioned local-formula-and-item information--e.g., "Nabisco Zweiback Teething Toast". Other data in said local-formula-and-item information includes, for example, the street address of every one of said supermarket chain's markets in the locality said station.

Other formula-and-item-of-this-transmission information can be compute: program instructions. For example, another of the aforementioned discounts and cents-off coupon specials is of a particular product--e.g. untrimmed pork bellies--that is advertised in the conventional television programming of unit Q. In the conventional programming, an announcer makes an offer, "Super Discount Supermarkets will deliver to you, at cost, all the pork you need . . ." In the example, the costs of delivery involve transportation from the central warehouse of the supermarket chain to each local market and transportation from each market to the station of any given subscriber who orders a pork belly package. In the example, the cost of delivery for any given subscriber is calculated under control of formulae that are computer program instructions.

The particulars of the untrimmed pork belly and "Nabisco Zweiback

Teething Toast" specials of example #9 illustrate generating formula-and-item-of-this-transmission information.

The cost of a unit of pork belly product for any given subscriber is computed according to a particular formula:

$$Y=a+b+c(X) \qquad (1)$$

where:

Y is the delivered cost to said subscriber per unit of pork belly product,

a is the supermarket chain's cost per unit of pork belly onboard an outbound vehicle at said warehouse,

b is the cost of transportation to the market of said subscriber,

c is the cost per mile of transportation that applies to deliveries from said market, and

X is the distance in miles between said market the station of said subscriber.

Pork belly prices vary from day to day as so-called "spot" prices change on commodity markets. And transportation costs vary from time to time and place to place according to variations in, for example, costs of gasoline and wages of vehicle drivers. Accordingly, each time the programming of unit Q is transmitted to subscribers, the values of variables a, b, and c in equation (1) that are applicable to the particular time and place of transmission must be computed and processed. For any given transmission of the television commercial of program unit Q, the price of an advertised unit of pork bellies (which price is a) is a datum that is preentered into computer, 73, and recorded in said local-formula-and-item information. And said values of b and c are computed according to the following equations (2) and (3) respectively:

$$b=(p+q+d)Z \qquad (2)$$

where:

b is the b of equation (1),

p is the cost of gasoline per pork belly unit mile between said warehouse and said market,

q is the wage of the driver per unit mile between said warehouse and said market,

d is the depreciation of the vehicle per unit mile between said warehouse and said market, and

Z is the distance in miles between said warehouse and said market.

$$c=r+s+dd \qquad (3)$$

where:

c is the c of equation (1),

r is the cost of gasoline per unit mile between said market and the station of said subscriber,

s is the wage of the local driver per unit mile between said market and said station, and

dd is the depreciation of the local vehicle per unit mile between said market and said station.

For any given transmission of the television commercial of program unit Q, the following variables are also data that are pre-entered into computer, 73, and recorded in said local-formula-and-item information: p, q, d, Z, r, s, and dd.

At the aforementioned interval Q time prior to the scheduled playing of

Q, when computer, 73, commences generating said program instruction set, the local-formula-and-item information of computer, 73, includes information that:

a is 1000.00
p is 0.00625
q is 0.12
d is 0.1
Z is 275
r is 0.007
s is 2.00
dd is 0.11

The intermediate generation set information of said generate-set-information message (#9) includes program instructions that cause each addressed ITS computer, 73, to compute values of variables b and c according to formulas (2) and (3), given the local-formula-and-item information of p, q, d, Z, r, s, and dd, and to incorporate said computed values of b and c into generally applicable program instruction set information of equation (1).

Executing the information of said intermediate generation set causes computer, 73, to generate said program instruction set in the following fashion. Automatically, computer, 73, selects information of each of the aforementioned variables, a, p, q, d, Z, r, s, and dd; computes the value of variable b, under control of intermediate generation set instructions of equation (2), to be 62.21875; computes the value of variable c, under control of intermediate generation set instructions of equation (3), to be 2.117; and replaces particular variable values, a, b, and c, in a particular so-called "higher language line of program code" that is among the aforementioned generally applicable information of said program instruction set and is:

Y=a+b+(c*X)

[which is equation (1) in the language of the IBM BASIC of the IBM Personal Computer Hardware Reference Library] with said selected information of a and the so computed information of b and c to become formula-and-item-of-this-transmission information of:

Y=1000.00+62.21875+(2.117 * X)

[which is formula-and-item-of-this-transmission information in said BASIC]. Automatically, computer, 73, selects and computes information of other variables and replaces other variable values of said generally applicable program instruction set information until a complete instance of higher language code of said program instruction set with all required formula-and-item-of-this-transmission information has been generated and exists at particular memory. Automatically, computer, 73, compiles the information of said instance and places the resulting so-called "object module" at particular memory (which compiling could be done, in the case of a program written in IBM BASIC, with the IBM BASIC Compiler of the IBM Personal Computer Computer Language Series). Automatically, computer, 73, links the information of said object module with information of other compiled object modules that exist in memory at computer, 73, (and may have been transmitted to computer, 73, in the generally applicable program instruction set information if said intermediate generation set; generates a particular PROGRAM.EXE output file that is said program instruction set; and places said file at particular program-set-to-transmit memory of computer, 73, (which linking could be done, in the

case of a program compiled by the IBM BASIC Compiler with the linker program of the IBM Risk Operating System of the IBM Personal Computer Computer Language Series). One of said other compiled object modules is a module that, when accessed in a fashion well known in the art, computes the shortest vehicle driving distance between any two locations in the local vicinity of the station of FIG. 6 when passed two street addresses of said vicinity. (Hereinafter, the program instruction set generated in example #9, under control of said intermediate generation set of Q, is called the "program instruction set of Q".)

Executing the information of said intermediate generation set causes computer, 73, also to generate a particular associated data module. (Hereinafter, a data module that is transmitted to subscriber stations and processed by computers of said stations under control of instructions of a program instruction set is called a "data module set," and any given intermediate generation set may cause generation of information of a data module set or sets in addition to or rather than generating information of a program instruction set or sets.) In a fashion well known in the art, computer, 73, selects, from among the data in said local-formula-and-item information, information of the aforementioned "Nabisco Zweiback Teething Toast"; information of the street address of every one of said supermarket chain's markets in the local vicinity of the station of FIG. 6; particular cost-of-a-trimmed-pork-belly-unit information of 1987.25 that is the cost of all the trimmed cuts of meat of a pork belly unit; binary video image information of several telephone numbers, including a particular southwest delivery route telephone number, "456-1414", and a particular northwest delivery route telephone number, "224-3121"; and information of the particular local-automatic-order-taking telephone number of the supermarket chain applicable in the vicinity of the intermediate transmission station of FIG. 6 which is 1-(800) 247-8700. Automatically, computer, 73, places said selected information (and any other information so selected) in a particular file called DATA--OF. ITS until the information of said file constitutes a complete instance of a particular data module set of Q. (Hereinafter, the data module set generated in example #9, under control of said intermediate generation set of Q, is called the "data module set of Q".)

Subsequently, at the scheduled time of the playing of Q, the station of FIG. 6 is transmitting via modulator, 83, a television network transmission that is inputted to matrix switch, 75, from distribution amplifier, 63. At said time, at the particular program originating studio that originates said network transmission, a particular SPAM message that contains execution and meter-monitor segments and that is addressed to ITS computers, 73, is embedded in said network transmission and transmitted. (Hereinafter, said message is called the "first cueing message (#9).")

Transmitting said message causes that decoder of signal processing system, 71, that receives the transmission of said distribution amplifier, 63, to detect said message and input said message, with appropriate source mark information, via code reader, 72, to computer, 73.

Receiving said message and said mark information causes computer, 73, to so-called "cue" recorder, 76, and generator, 82, and to operate in its automatic playing fashion. Receiving said message and mark causes

computer, 73, to cause recorder, 76, to commence playing and to cause matrix switch, 75, to configure its switches so as to cease transferring programming inputted from distribution amplifier, 63, to modulation 83, then to commence transferring the output of recorder, 76, to modulator, 83, which causes the transmission of unit Q to field distribution system, 93. In addition, because the playing schedule of the station of FIG. 6 includes preprogrammed information that program unit Q is combined medium programming, receiving said message causes generator, 72, to cease embedding other signal information in the normal transmission location (such as, for example, teletext information well known in the art [and in so causing said generator, 82, to cease embedding said other information--for, example, said teletext--detecting said message at said intermediate station causes subscriber stations that are receiving said other information--for, example, said teletext--to cease receiving said other information]) and to transmit information of a SPAM end of file signal (and in so doing, to cause subscriber station decoder apparatus--for example, apparatus at teletext processor units--to commence detecting and discarding SPAM messages of the combined medium programming of Q).

Causing recorder, 76, to play causes recorder, 76, to transmit programming of Q, via matrix switch, 75, and modulator, 83, to field distribution system, 93, and also causes recorder, 76, to input the programming of Q to decoder, 77.

Immediately after commencing to transmit said programming of Q, recorder 76, plays and transmits three SPAM messages that are embedded in the prerecorded programming of Q.

The first message is addressed to URS signal processors, 200, and causes subscriber stations that are tuned to the channel of transmission of said modulator, 83, to combine their microcomputers, 205, to the computer system of said transmission, which transmission is originated by said recorder, 76. (Said message and the functioning that said message causes are described more fully below, and hereinafter, said message is called the "align-URS-microcomputers-205 message (#9)".)

The second message is embedded in the prerecorded programming of Q at a distance after said first message that is sufficient to allow time for apparatus at each of said subscriber stations so to combine. The execution segment of said second message is of the aforementioned pseudo command, and transmitting said message causes decoder apparatus at said subscriber stations each to detect an end of file signal and to commence identifying and processing the individual SPAM messages of the SPAM information subsequently embedded in the transmission of the programming of Q. (Said message and the functioning that said message causes are described more fully below, and hereinafter, said message is called the "synch-SPAM-reception message (#9)".) Thereafter, embedding and transmitting any given SPAM message in said transmission invokes a controlled function or functions at particular ones of said decoder apparatus.

The third message invokes broadcast control of the microcomputers, 205, of said stations in the invoking broadcast control fashion described above in "One Combined Medium." Said third message is embedded in said prerecorded programming of Q immediately after said second message and is addressed to URS decoders, 203. (Said message is described more fully

below, and hereinafter, said message is called, the "control-invoking message (#9)".) Said message causes each decoder, 203, to input control invoking instructions (that are preprogrammed at said decoder, 203) to its associated microcomputer, 205. In so doing, transmitting said control-invoking message (#9) causes the microcomputers, 205, of said subscriber stations to come under control of the computer system of said recorder, 77.

Causing recorder, 73, to play unit Q causes the decoder, 77, of the station of FIG. 6 then to detect a series of SPAM messages that are embedded in the programming of Q and are addressed to ITS computers, 73. Detecting said messages causes decoder, 77, to transfer said messages to computer, 73. (Decoder, 80, can detect and transfer said messages to computer, 73, but in respect to any given embedded signal in a programming transmission, computer, 73, is preprogrammed to operator under the control of just one decoder; decoder, 77 or 79, is the default decoder for transmissions from recorded 76 or 78 respectively, and signal processor, 71, contains the default decoder of any given transmission receiver at a receiver; and computer, 73, is preprogrammed to operate under the control of signals from decoder, 80, only for verifying the transmission of signals unless its methods of processing signals from decoder, 80, are changed in a predetermined fashion.)

The first message of said series contains execution and meter-monitor segments (Said first message is called, hereinafter, the "transmit-data-module-set message (#9)".)

Receiving said transmit-data-module-set message (#9) causes computer, 73, to generate a particular first outbound SPAM message that includes information of the aforementioned data file, DATA--OF.ITS, whose information constitutes a complete instance of a data module set of Q and to cause said message to be embedded in the transmission of the programming of Q and transmitted to field distribution system, 93, in the following.fashion. (Hereinafter, said first outbound SPAM C message is called the "data-module-set message (#9).") Automatically, computer, 73, causes stripper, 81, to commence stripping all signals from the normal transmission location; causes generator, 82, to commence embedding information received from computer, 73; selects the information of said meter-monitor segment, adds particular information that identifies the station of FIG. 6 and the time of transmission, modifies the meter-monitor format field information to reflect said added information, and retains the received, added, and modified meter-monitor information; and selects and transmits to generator, 82, complete information of said data-module-set message (#9). In selecting and transmitting said complete information, computer, 73, automatically selects and transmits information of a "01" header; information of a particular SPAM execution segment that is addressed to URS microcomputers, 205; said retained meter-monitor information; any required padding bits (the requirement for and number which computer, 73, determines in a predetermined fashion); complete information of said data file, DATA--OF.ITS; and information of a SPAM end of file signal.

(The apparatus of the station of FIG. 6 may be preprogrammed in such a fashion that computer, 73, causes generator, 82, to cease extending in the normal transmission location other signal information such as teletext information then to transmit an end of file signal each time computer, 73, causes generator, 82, to embed a SPAM message of the

programming of Q then to recommence transmitting other signal information such as teletext automatically upon embedding said last named message by transmitting an "01" header; execution segment information addressed to appropriate URS receiver apparatus such as URS teletext receiver apparatus; appropriate meter-monitor information; padding bits as required; and information segment information of said other signal information such as teletext. [No end of file signal is transmitted until generator, 82, is caused to cease the transmission of said other signal information.])

Receiving the information of said data-module-set message (#9) causes generator, 82, to embed said information in the normal transmission location of the programming of Q transmission being transmitted via generator, 82, to field distribution system, 93, thereby transmitting said data-module-set message (#9) to said system, 93.

In due course, decoder, 77, detects the second SPAM message in the aforementioned series of SPAM messages that are addressed to ITS computers, 73, and transfers said message to computer, 73.

Said second message contains execution and meter-monitor segments (and is called, hereinafter, the "transmit-and-execute-program-instruction-set message (#9).")

Receiving said transmit-and-execute-program-instruction-set message (#9) causes computer, 73, to generate a second outbound SPAM message that includes information of said program instruction set of Q and to cause said message to be embedded in the transmission of the programming of Q and transmitted to field distribution system, 93, in the following fashion. (Hereinafter, said second outbound SPAM message is called the "program-instruction-set message (#9).") Automatically, computer, 73, selects the information of said meter-monitor segment, adds particular information that identifies the station of FIG. 6 and the time of transmission, modifies the meter-monitor format field information to reflect said added information, and retains the received, added, and modified meter-monitor information. Then, automatically, computer, 73, selects and transmits to generator, 82, information of a "01" header; information of a particular SPAM execution segment that is addressed to URS microcomputers, 205; said retained meter-monitor information; any required padding bits; complete information of the aforementioned file that is at the aforementioned program-set-to-transmit memory of computer, 73, and that is said program instruction set of Q; and information of a SPAM end of file signal. Said selected and transmitted information is complete information of said program-instruction-set message (#9).

Receiving said information causes generator, 82, to embed said information in the normal transmission location of the programming of Q transmission being transmitted via generator, 82, to field distribution system, 93, thereby transmitting said program-instruction-set message (#9) to said system, 93.

Then decoder, 77, detects the third SPAM message in the aforementioned series of SPAM messages that are addressed to ITS computers, 73, and transfers said message to computer, 73.

Said third message contains an execution segment and is addressed to ITS computers, 73. (Said third message is called, hereinafter, the

"cease-stripping-and-embedding message (#9)".)

Receiving said message causes computer, 73, to cause stripper, 81, to cease stripping signal information from the normal transmission location and to cause generator, 82, to cease embedding signal information in the normal transmission location.

Subsequently, as recorder, 76, plays and transmits the programming of Q, via modulator, 83, to field distribution system, 93, recorder, 76, transmits eight SPAM messages that are embedded in the prerecorded programming of Q. (Hereinafter, said messages are called [in the order in which said messages are transmitted], the "1st commence-outputting message (#9)", the "2nd commence-outputting message (#9)", the "3rd commence-outputting message (#9)", the "1st cease-outputting message (#9)", the "4th commence-outputting message (#9)", the "5th commence-outputting message (#9)", the "6th commence-outputting message (#9)", and the "2nd cease-outputting message (#9)".) Each of said eight SPAM messages contains execution segment information addressed to URS microcomputers, 205, (which causes decoder, 77, to discard the information of said messages). Said messages are discussed more fully below.

At the scheduled end time of the playing of program unit Q, another particular SPAM message that contains an execution segment and that is addressed to ITS computers, 73, is embedded at said program originating studio and transmitted in said network transmission. (Hereinafter, said message is called the "second cueing message (#9).")

Transmitting said message causes said decoder of signal processing system, 71, to detect said message and input said message, with appropriate source mark information, to computer, 73.

Receiving said message and said mark information causes computer, 73, to so-called "cue" said network transmission and continue in its automatic playing fashion. Automatically, computer, 73, causes matrix switch, 75, to configure its switches to cease transferring the output of recorder, 76, to modulator, 83, and commence transferring the transmission inputted from distribution amplifier, 63, to modulator, 83, which causes the transmission said network transmission to field distribution system, 93. Automatically, computer, 73, may cause generator, 82, to embed a particular message (that is described more fully below and called, hereinafter, the "disband-URS-microcomputers-205 message (#9)") that causes subscriber stations whose microcomputers, 205, are combined to the computer system of the transmission of recorder, 76, to separate said microcomputers, 205, from said transmission. Automatically, according to the play schedule of the station of FIG. 6, computer, 73, may cause generator, 82, to commence embedding other signal information in the normal transmission location (such as, for example, teletext information [and in so causing said generator, 82, to commence embedding said other information--for, example, said teletext--detecting said message at said intermediate station causes subscriber stations that are receiving said other information--for, example, said teletext--to commence receiving said other information]), by transmitting an "01" header then execution segment information addressed to receiver apparatus of said other information then appropriate meter-monitor information then said other information. And automatically, computer, 73, causes recorder, 76, to cease playing and to commence preparing to play its next scheduled local

origination program unit.

(Example #9 ends, insofar as intermediate station operations are concerned, with computer, 73, commencing to prepare to play said next program unit; however, the effects of so transmitting unit Q and said data-module-set message (#9), said program-instruction-set message (#9), said 1st commence-outputting message (#9), said 1st cease-outputting message (#9), said 2nd commence-outputting message (#9), said 3rd commence-outputting message (#9), and said 2nd cease-outputting message (#9) are described more fully below.)

Network Control of Intermediate Generating and Embedding . . . Example #10

In the present invention, a remote network origination and control station, such as the aforementioned program originating studio that originates the transmission of the "Wall Street Week" program, can control a plurality of intermediate transmission stations in generating and embedding combined medium control instructions--that is, program instruction sets, data module sets, and combining synch commands--that control generating and transmitting at pluralities of ultimate receiver stations.

An example #10, focuses on combined medium network control of intermediate transmission stations, controlling ultimate receiver stations.

In example #10, a particular program originating studio transmits the commercial of program unit Q in a network transmission and controls a plurality of intermediate transmission stations each of which controls, in turn, a plurality of subscriber stations that are ultimate receiver stations.

The station of FIG. 6 is one intermediate transmission station controlled by said studio. The station of FIG. 6 receives said network transmission at receiver, 53, and retransmits said transmission immediately via modulator, 83. The program unit Q of example #10 is identical to the program unit Q of example #9, and each intermediate transmission station must generate transmit its own, station specific program instruction set and data module set information that contains its own, station specific formula-and-item-of-this-transmission information.

Prior to a particular early time, complete local-formula-and-item information is inputted to and caused to be recorded at the computer, 73, of each controlled intermediate transmission station in such a way that each computer, 73, contains complete information relevant to the particular discounts and specials in effect at the particular markets in the vicinity of said station and at the particular time of the network transmission of Q. Thus each computer, 73, contains the specific values of a, p, q, d, Z, r, s, and dd of its specific station; the specific street address of every one of said supermarket chain's markets in the locality of said station; and other specific data of said station such as, for example, "Nabisco Zweiback Teething Toast".

Local-formula-and-item information can be inputted to said computers, 73, in any fashion that said computers, 73, can receive information. However, in the preferred embodiment, information that applies at all

network stations at the time of any given transmission of a given program unit--for example, the undelivered per unit cost of pork bellies: a--is transmitted to all stations simultaneously in a SPAM message that causes each station to select and record properly said information. And information that applies only at a selected one of said stations--for example, the street address of every one of said supermarket chain's markets in the locality of a given station--is inputted individually to the computers, 73, of said stations by means of, for example, a local input, 74, or a network, 98.

At the computer, 73, of the station of FIG. 6, the local-formula-and-item information in example #10 is identical to the local-formula-and-item information in example #9. For example, said local-formula-and-item information in example #10 includes:

a is 1000.00
p is 0.00625
q is 0.12
d is 0.1
Z is 275
r is 0.007
s is 2.00
dd is 0.11

(At a particular second intermediate transmission station, the local-formula-and-item information of the computer, 73, include the specific values: a is 1000.00, p is 0.00625, q is 0.13, d is 0.11, Z is 537, r is 0.0082, s is 1.98, and dd is 0.10. Said local-formula-and-item information also includes the specific street address of one of said supermarket chain's markets in the locality of said station, particular cost-of-a-trimmed-pork-belly-unit information of 2021.42 that is the cost of the trimmed meat of one pork belly unit; binary video image information of several telephone numbers, including a particular southeast delivery route telephone number, "623-3000"; information of the particular local-automatic-order-taking telephone number of the supermarket chain applicable in the vicinity of said second intermediate station which is 1-(800) 371-2100; and specific data of "Cheerios Toasted Oat Cereal" instead of "Nabisco Zweiback Teething Toast."

At said early time (which time is, in the preferred embodiment, a time of reduced operational requirement such as, for example, the middle of the night that precedes said network transmission of Q), the computers, 73, of said controlled intermediate transmission stations are caused to receive information of a particular transmission. For example, at 3:00 AM on said night, automatic schedule information and instructions (previously inputted by a computer at said network originating and control station, via network, 98, individually to each of said computers, 73) causes said computers, 73, to cause their associated earth station receivers, 50, amplifiers, 51, and TV receivers, 53, to tune to a particular satellite transmission (while causing the switches, 75, to output information of said transmission to no modulator, 83, 87, or 91). Causing said station apparatus to tune to said transmission causes those particular dedicated decoders of the signal processor systems, 71, of said stations that process continuously the inputted transmission of the distribution amplifiers, 63, to detect SPAM information embedded in the normal transmission location of said transmission and input said SPAM information to the computers, 73, of said stations.

Then the program originating studio at said network originating and control station, embeds in said normal transmission location and transmits a SPAM message that is addressed to ITS computers, 73, and consists of a "01" header, a particular execution segment, appropriate meter-monitor information, padding bits as required, information segment information of the aforementioned intermediate generation set of Q, and an end of file signal. (Hereinafter, said message is called the "generate-set-information message (#10)".) Except for its meter-monitor information, said generate-set-information message (#10) is identical to the aforementioned generate-set-information message (#9).

Transmitting said generate-set-information message (#10) causes said dedicated decoders to detect and input said message to the computers, 73, of said stations.

Receiving said message at said computers, 73, causes each of said computers, 73, to load information of said intermediate generation set at particular RAM. Then receiving the end of file signal that ends said message causes each of said computers, 73, to execute the information so loaded as a machine language job; to compute the specific formula-and-item-of-this-transmission-information of said computer, 73, in the predetermined fashion of said intermediate generation set according to the prerecorded data of the local-formula-and-item information of said computer, 73; to compile said specific formula-and-item-of-this-transmission information into one or more specific machine language program modules; and to link said specific module or modules to other program modules to become complete program instruction set information of this instance of the network transmission of Q; and to record said information at particular memory. (Hereinafter, the program instruction set generated at the station of FIG. 6 in example #10 is called the "program instruction set of Q.1", signifying that said set is one version of complete program instruction set information of said instance of the network transmission of Q.) Executing the information of said intermediate generation set also causes each said computers, 73, to generate and record complete information of a data module set. (Hereinafter, the data module set generated at the station of FIG. 6 in example #10 is called the "data module set of Q.1", signifying that said set is one version of complete data module set information of said instance of the network transmission of Q.) In the preferred embodiment, executing said intermediate generation set at said early time causes said computers, 73, to record said program instruction set of Q and said data module set of Q information at non-volatile, disk memory.

At the station of FIG. 6, for example, executing the information of said intermediate generation set causes the computer, 73, in precisely the fashion that applied in example #9, to compute the value of a particular variable b to be 62.21875; to computes the value of a particular variable c to be 2.117; and to replaces particular variable values, a, b, and c, in a particular so-called "higher language line of program code" to become formula-and-item-of-this-transmission information of:

Y=1000.00+62.21875+(2.117* X)

to select, compute, and replace other variable information until complete program instruction set information exists in higher language code at particular memory; to compile said higher language information; to link the information so complied with other compiled information; and to record the information so computed, compiled, and linked (which is

complete information the program instruction set of Q of the station of FIG. 6) in a file named "PROGRAM.EXE", in a fashion well known in the art, on a computer memory disk of computer, 73. In so doing, said computer, 73, generates the specific program instruction set version--that is, the program instruction set of Q.1--that applies to the particular discounts and specials in effect at the particular markets in the vicinity of said station and at the particular time of the network transmission of Q. In precisely the fashion that applied in example #9, executing the information of said intermediate generation set causes said computer, 73, to select data, from among the local-formula-and-item information of said station, including the aforementioned "Nabisco Zweiback Teething Toast" and the street address of every one of said supermarket chain's markets in the local vicinity of the station of FIG. 6, and to record said selected data on said memory disk in a data file named DATA.sub.-- OF.ITS. In so doing, said computer, 73, generates said data module set of Q.1.

(At said second intermediate transmission station, executing the information of said intermediate generation set causes the computer, 73, of said station to compute the values of variables b and c as 132.2362 and 2.0882 respectively; to replace variable values, a, b, and c, with formula-and-item-of-this-transmission information of:

Y=1000.00+132.2362+(2.0882* X)

to process other variable information; and to compile, link, and record information at a particular peripheral memory unit of said computer, 73, in a file named "PROGRAM.EXE" that is the specific program instruction set of said second intermediate station. [Hereinafter, the program instruction set generated at said second station is called the "program instruction set of Q.2", signifying that said set is a second version of complete program instruction set information of said instance of the network transmission of Q.] Executing the information of said intermediate generation set causes said computer, 73, also to select particular data, including said "Cheerios Toasted Oat Cereal" and the street address of every one of said supermarket chain's markets in the locality of said second intermediate station and to record said selected data at said memory unit in a data file named DATA.sub.-- OF.ITS that corresponds in content to the file of the same name generated a the intermediate station of FIG. 6. [Hereinafter, the data module set generated at said second station is called the "data module set of Q.2", signifying that said set is a second version of complete data module set information of said instance of the network transmission of Q.])

(One difference between example #9 and example #10, which is based on the preprogrammed schedule information of each intermediate transmission station, is that executing the information of the generate-set-information message (#10) causes the generated program instruction set and data module set information to be recorded at non-volatile, disk memory whereas in example #10 the generated information may be recorded merely at RAM.)

Shortly before commencing to transmit the television programming of unit Q, at a time when all controlled intermediate transmission stations are receiving and retransmitting said network transmission (which the station of FIG. 6 and said second station each receives at a receiver, 53, and transmits via a modulator, 83), said program originating studio embeds in the normal transmission location of said transmission and transmits a

second SPAM message. Said second message is addressed to ITS computers, 73, and consists of a "01" header, a particular execution segment, appropriate meter-monitor information, padding bits as required, particular information segment instruction information, and an end of file signal. (Hereinafter, said message is called the "load-set-information message (#10)".)

Transmitting said message causes the decoders of the signal processing systems, 71, of said stations that receive programming transmissions from the distribution amplifiers, 63, to detect and input said message to the computers, 73, of said stations.

Receiving said message causes each of said computers, 73, to load said information segment instruction information at particular RAM. Then receiving said end of file signal causes each of said computers, 73, to execute the instruction information of so loaded as an compiled, machine language job.

Executing said instruction information causes said computers, 73, each to load the information of said files, PROGRAM.EXE and DATA.sub.--OF.ITS, at particular program-set-to-transmit and data-set-to-transmit RAM memories of computer, 73, and each to cause a generator, 82, to cease embedding any other signal information in the normal transmission location and to transmit information of a SPAM end of file signal. (Said other signal information may include, for example, teletext information, and in so causing said generators, 82, to cease embedding said other information--for example, said teletext--transmitting said message causes pluralities of ultimate receiver stations that are subscriber stations of said intermediate transmission stations to cease receiving said other information--for example, said teletext.)

Then said program originating studio starts to transmit the conventional television programming of unit Q.

Immediately after commencing to transmit said programming of Q, said studio embeds in the normal transmission location of the transmission of said programming and transmits a particular SPAM message is addressed to URS signal processors, 200, and that causes ultimate receiver stations to combine their microcomputers, 205, to the computer system of the transmission of said program originating studio. (Said message and the functioning that said message causes are described more fully below, and hereinafter, said message is called the "align-URS-microcomputers-205 message (#10)".)

After an interval that is sufficient to allow apparatus at each ultimate receiver station so to combine, said studio embeds in said transmission and transmits a particular SPAM message whose execution segment is of the aforementioned pseudo command. Transmitting said message causes particular decoder apparatus at said ultimate receiver stations to detect an end of file signal and to commence identifying and processing the individual SPAM messages of the SPAM information subsequently embedded in the transmission of the programming of Q. (Said message and the functioning that said message causes are described more fully below, and hereinafter, said message is called the "synch-SPAM-reception message (#10)".) Thereafter, embedding and transmitting any given SPAM message in said transmission invokes a controlled function or functions at particular ones of said decoder apparatus.

Then said studio invokes broadcast control of the microcomputers, 205, of said stations. Said studio embeds in said transmission and transmits a particular SPAM message that is addressed to URS decoders, 203. (Said message is described more fully below, and hereinafter, said message is called, the "control-invoking message (#10)".) Said message causes each decoder, 203, to input the aforementioned control invoking instructions (that are preprogrammed at said decoder, 203) to its associated microcomputer, 205. In so doing, transmitting said control-invoking message (#10) causes said microcomputers, 205, to come under control of the computer system of the transmission of said studio.

Then said studio embeds in said transmission and transmits a SPAM message is addressed to ITS computers, 73, and that contains execution and meter-monitor segments. (Said message is called, hereinafter, the "transmit-data-module-set message (#10)".) Receiving said transmit-data-module-set message (#10) causes each of said computers, 73, to cause stripping and embedding to commence; to generate a particular first outbound SPAM message that includes information of the data file, DATA.sub.-- OF.ITS, at its data-set-to-transmit RAM memory; and to cause said message to be transmitted to its field distribution system, 93. (Hereinafter, the first outbound SPAM message of any given one of said computers, 73, is called a "data-module-set message (#10)" and all of said first messages are the "data-module-set messages (#10)".) At the station of FIG. 6, the computer, 73, automatically causes stripper, 81, station to commence stripping all signals from the normal transmission location; causes generator, 82, to commence embedding information received from said computers, 73; selects the information of the meter-monitor segment of said transmit- data-module-set message (#10); adds particular information that identifies the station of FIG. 6 and the time of transmission; modifies the meter-monitor format field information to reflect said added information; and retains the received, added, and modified meter-monitor information. Then said computer, 73, selects and transmits to generator, 82, complete information of its data-module-set message (#10) in the following fashion. Automatically, said computer, 73, selects and transmits information of a "01" header; information of a particular SPAM execution segment that is addressed to URS microcomputers, 205; said retained meter-monitor information; any required padding bits (the requirement for and number which said computer, 73, determines in a predetermined fashion); complete information of the data file at the data-set-to-transmit RAM memory of said computer, 73, which is said file, DATA.sub.-- OF.ITS and which is complete information of said data module set of Q.1; and information of a SPAM end of file signal. (Receiving said message at said second intermediate station causes the apparatus of said station, in the same fashion, to generate and transmit the data-module-set message (#10) of said station which includes meter-monitor information that identifies said second station and said data module set of Q.2.)

Receiving the information of the particular data-module-set message (#10) of the computer, 73, of its station causes each generator, 82, to embed said information in the normal transmission location of the programming of Q transmission being transmitted via said generator, 82, to the field distribution system, 93, of said station, thereby transmitting the particular data-module-set message (#10) of said station to said system, 93.

Then said program originating studio embeds in the normal transmission location of said transmission and transmits a SPAM message that is addressed to ITS computers, 73, and that contains execution and meter-monitor segments. (Said message is called, hereinafter, the "transmit-and-execute-program-instruction-set message (#10)".)

Receiving said message causes each of said computers, 73, to generate a second outbound SPAM message that includes information of the program instruction set at its program-set-to-transmit RAM memory and to cause said message to be transmitted to its field distribution system, 93. (Hereinafter, the second outbound SPAM message of any given one of said SPAM computers, 73, is called a "program-instruction-set message (#10)", and all of said second messages are the "program-instruction-set messages (#10).") Automatically, each of said computers, 73, selects the information of said meter-monitor segment, adds particular information that identifies its station and the time of transmission, modifies the meter-monitor format field information to reflect said added information, and retains the received, added, and modified meter-monitor information. Then, automatically, each of said computers, 73, selects and transmits to the generator, 82, of its station, information of a "01" header; information of a particular SPAM execution segment that is addressed to URS microcomputers, 205; its retained meter-monitor information; any required padding bits; complete information of the program instruction set that is at its program-set-to transmit RAM memory; and information of a SPAM end of file signal. Said selected and transmitted information that each of said computers, 73, transmits is complete information of the particular program-instruction-set message (#10) of said computer, 73. (Receiving said message causes the apparatus of the intermediate station of FIG. 6 to transmit the program instruction set of Q.1 in the program-instruction-set message (#10) of said station and causes the apparatus of said second intermediate station to transmit the program instruction set of Q.2 in the program-instruction-set message (#10) of said second station.)

Receiving the information of the particular program-instruction-set message (#10) of the computer, 73, of its station causes a generator, 82, to embed said information in the normal transmission location of the programming of Q transmission being transmitted via said generator, 82, to the field distribution system, 93, of said station, thereby transmitting the particular program-instruction-set message (#10) of said station to said system, 93.

(After transmitting the aforementioned transmit-data-module-set message (#10) and before transmitting a particular commence-outputting message (#10) that is discussed more fully below, said program originating studio embeds and transmits other SPAM messages that are addressed to URS microcomputers, 205. Said other messages correspond in function to the data-module-set messages (#10) and program-instruction-set messages (#10) of the intermediate transmission stations of example #10 but said other messages are transmitted to and control microcomputers, 205, at particular direct-receiving ultimate receiver stations that receive the transmission of said studio directly rather than via a retransmission of one of said intermediate transmission stations. Information of said other messages is received at the aforementioned decoders of the signal processing systems, 71, of said stations that process the transmission of said studio, but said decoders discard said SPAM messages because said decoders are preprogrammed only to transmit or execute controlled

functions of SPAM messages that are addressed to intermediate transmission station apparatus. And said other SPAM messages do not reach the ultimate receiver stations to which said intermediate transmission stations transmit said data-module-set messages (#10) and program-instruction-set messages (#10) because said other SPAM messages are stripped from the transmissions of said stations by the strippers, 81, of said stations.)

Then said program originating studio embeds in the normal transmission location of said network transmission and transmits a SPAM message that is addressed to ITS computers, 3, and that contains an execution segment. (Said message is called, hereinafter, the "cease-stripping-and-embedding message (#10)".)

Receiving said message causes each of said computers, 73, to cause the stripper, 81, of its station to cease stripping signal information from the normal transmission location and causes each of said computers, 73, to cause the generator, 82, to cease embedding signal information generated under control of said intermediate generation set in the normal transmission location.

Subsequently, said program originating studio embeds in the normal transmission location of said network transmission and transmits a further series of messages that are addressed to URS microcomputers, 205, and that are described more fully below. (Hereinafter, said messages are called [in the order in which said messages are transmitted at said studio]: the "1st commence-outputting message (#10)", the "2nd commence-outputting message (#10)", the "3rd commence-outputting message (#10)", the "1st cease-outputting message (#10)", the "4th commence-outputting message (#10)", the "5th commence-outputting message (#10)", the "6th commence-outputting message (#10)", and the "2nd cease-outputting message (#10)".)

After transmitting the last conventional programming of Q, said studio embeds and transmits a particular message (that is described more fully below and called, hereinafter, the "disband-URS-microcomputers-205 message (#10)") that causes subscriber stations whose microcomputers, 205, are combined to the computer system of the transmission of said studio to separate said microcomputers, 205, from said transmission.

Then said studio embeds and transmits a particular SPAM message that contains an execution segment and that is addressed to ITS computers, 73. (Hereinafter, said message is called the "local-output-cueing message (#10).")

Receiving said message and said mark information causes intermediate transmission stations to continue transmitting locally originated programming in their scheduled fashions. At the station of FIG. 6, the dedicated decoder of signal processor system, 71, that processes the inputted transmission of distribution amplifier, 63, detects said message and inputs said message, with appropriate source mark information, to computer, 73. Automatically, receiving said message may cause computer, 73, to cause generator, 82, to commence embedding other signal information in the normal transmission location, such as, for example, teletext information. Automatically, generator, 82, embeds a "01" header; execution segment information addressed to appropriate URS receiver apparatus such as URS teletext receiver apparatus; appropriate

meter-monitor information; padding bits as required; and information segment information of said other signal information--for example, teletext. (No end of file signal is transmitted until generator, 82, is caused to cease the transmission of said other signal information.) In so doing, transmitting said local-output-cueing message (#10) causes one or more ultimate receiver stations that are subscriber stations of said intermediate transmission station of FIG. 6 to commence receiving said other information--for example, said teletext. Simultaneously, other intermediate stations such as said second station commence embedding their specific other signal information--for example, their own specific teletext information which has different information content from the information of the station of FIG. 6--causing subscriber stations of said other intermediate stations that are tuned to receive said other information to commence receiving said other information.

(Example #10 ends, insofar as intermediate station operations are concerned, with said computers, 73, causing their associated generators, 82, to commence embedding said other signal information; however, the effects of so transmitting the conventional programming of program unit Q and the SPAM messages that are associated with the network transmission of said programming and that are addressed to URS apparatus are discussed more fully below.)

So far this disclosure has described an intermediate transmission station transmitting conventional television programming. The station could process and transmit radio programming in the same fashions by adding radio transmission and audio recorder/player means, each with associated radio decoder means as shown in FIG. 2B, wherever television means are shown in FIG. 6, all with similar control means to that shown in FIG. 6 and by processing radio programming with appropriately embedded signals according to the same processing and transmitting methods described above. Likewise, the station could transmit broadcast print and data communications programming by adding appropriate transmission and recorder/player means and decoder/detector means with control means and using the same processing and transmitting methods. This example has described methods at a multi-channel intermediate transmission station; the methods are also applicable in a station that transmits only a single channel of television, radio, broadcast print or data. In addition, intermediate transmission station can be encrypted and decrypted and monitored in the fashions described above. Intermediate transmission station apparatus can include signal processing regulating system apparatus such as the apparatus of FIG. 4 by means of which encrypted transmissions that are transmitted to intermediate stations are caused to be decrypted and metered. Intermediate transmission station apparatus can include encryptor apparatus that encrypt programming transmissions selectively. And intermediate transmission station apparatus can include signal processing monitoring system apparatus in the spirit of the apparatus of FIG. 5 whereby the availability, use, and usage of programming at selected intermediate station apparatus is recorded and records are transmitted to remote stations that process such records.

Automating Ultimate Receiver Stations

Ultimate receiver stations are stations where programming is displayed (or otherwise outputted) to one or more subscribers, thereby enabling said subscriber or subscribers to view (or otherwise perceive) the information content of the programming. The programming so displayed (or

outputted) may be any form of electronically transmitted programming, including television, radio, print, data, and combined medium programming and may be received via any electronic transmission means including wireless and cable means. The programming so displayed (or outputted) may also include computer and/or combined medium programming that is locally generated under control of SPAM message information.

The signal processing apparatus outlined in FIGS. 2, 2A, 2B, 2C, and 2D, and their variants as appropriate, can be used to automate the operations of ultimate receiver stations in varieties of ways.

FIG. 7 exemplifies one embodiment of an ultimate receiver station; is a subscriber station in the field distribution system, 93, of the intermediate transmission station of FIG. 6; and may be a home, an office, a theater, a hotel, or any other station where programming such as television or radio is displayed to persons.

(NOTE: "Automating Ultimate Receiver Stations" focuses on controlling subscriber station apparatus in functions that do not necessarily involve generating or combining programming. Accordingly, whereas SPAM message transmission means have been depicted in FIGS. 1 through 6 by solid lines that depict programming transmission [said lines are often marked "SIGNALS ONLY" meaning SPAM information only], in FIG. 7 et seq. the means for transmitting SPAM messages that have been detected in and separated from programming transmissions are depicted by dashed lines that depict control information transmissions.)

FIG. 7 shows a variety of input apparatus with capacity for inputting programming (including SPAM information) selectively, via matrix switch, 258, to other apparatus of the subscriber station of FIG. 7; intermediate apparatus with capacity for processing and/or recording inputted programming selectively; output apparatus for displaying or otherwise outputting programming selectively to human senses; other controlled apparatus; and other meter apparatus.

Input apparatus include satellite earth station, 250, satellite receiver circuitry, 251, converter boxes, 201 and 222 (by means of which the station of FIG. 6 receives the multiplexed multi-channel cable transmission of the cable head end station of FIG. 6), antennas, 298 and 299, and other input apparatus, 252 (which may be, for example, a laser disc player or a record player); and the subscriber station of FIG. 4 has capacity for receiving wireless programming transmissions (for example, at a satellite earth station, 250, and satellite receiver circuitry, 251), a multi-channel cable transmission (for example, at converter boxes, 201 and 222), and locally transmitted input (for example, at other input apparatus, 252). Said input apparatus input their received information to matrix switch, 258, which is a conventional matrix switch, well known in the art.

Intermediate apparatus include microcomputer, 205, television recorder/player, 217, audio recorder/player, 255, computer memory unit, 256 (which may be, for example, a so-called "fixed disk"), decryptor, 224, decryptor, 231, signal stripper, 229, signal generator, 230, and other intermediate apparatus, 257, which could be, for example, other receiver/amplifier apparatus. In addition, the TV tuner apparatus of TV set, 202--that is, TV tuner, 215--(which is not distinguished from the TV monitor, 202M, apparatus of said set, 202, in FIG. 7), and the

tuner/amplifier apparatus of radio, 209--that is, radio tuner & amplifier, 213--(which is not distinguished from radio, 209, in FIG. 7), are also intermediate apparatus. All said intermediate apparatus receive their programming inputs from and transmit their programming outputs to matrix switch, 258.

Output apparatus that display or otherwise output programming selectively to human senses include, for example, TV monitor apparatus of TV set, 202, printer, 221, speaker system, 263, and one or more other output systems, 261 (which could be, for example, electronically actuated apparatus that emit odors). All said output apparatus receive their programming inputs from matrix switch, 258. (The monitor apparatus of TV set, 202, and the amplifier and speaker apparatus of radio, 209, have capacity for receiving a programming input that is separate from the inputs to the intermediate apparatus of said TV set, 202, and radio, 209, respectively.)

Other controlled apparatus include electronically actuated window opening and closing means, 208, furnace, 206, air conditioning system, 207, and other controlled apparatus, 260, which could be, for example, an electronically actuated automatic lawn watering system, all of which are well known in the art. Said other apparatus do not output programming and receive no input of programming.

Other meter apparatus include an electronically actuated utilities meter, 262, of which many models exist in the prior art for metering flows of electricity, gas, water, etc. Said meter, 262, does not output programming and receive no input of programming.

One or more appropriate SPAM decoders exist at each apparatus that receives and is controlled by SPAM message information. Appropriate SPAM decoders exist at microcomputer, 205, (which can be controlled in the fashions described above) at recorder/players, 217 and 255, (which recorder/players can be caused to operate in fashions similar to the recorder/players of the intermediate transmission station of FIG. 6) at radio, 209, and TV set, 202, (which radio and TV set can be actuated, tuned, and controlled in other functions) and at computer memory unit, 256, other intermediate apparatus, 257, printer, 221, speaker system, 263, and other output means, 261, (which unit, apparatus, printer, system, and means can be actuated individually and controlled in other functions. (For simplicity, FIG. 7 does not distinguish said decoders at or separately from their associated apparatus.)

Two matrix switches, 258 and 259, communicate the programming and SPAM message/control information transmissions among station apparatus. Matrix switch, 258, is a conventional matrix switch, well known in the art, with capacity for switching programming transmissions of television, radio, and other forms of electronically transmitted programming. Matrix switch, 259, is a digital matrix switch, well known in the art, with capacity for switching binary information transmissions. By means of matrix switch, 259, all apparatus communicate control information and the information of SPAM messages that have been detected in programming transmissions.

The station of FIG. 7 is preprogrammed to collect monitor information, and said decoders have bus means of the sort illustrated in FIG. 5 for communicating monitor information to an onboard controller, 14A, at signal processor, 200. (For simplicity, FIG. 7 does not show said monitor

information bus means.)

For communicating particular switching request control information to the controller, 20, of signal processor, 200, said decoders also have separate control information bus means (which, for simplicity, is also not shown in FIG. 7). A particular control processor, 20A, that is located, with appropriate RAM and ROM, at controller, 20; that is separate from the CPU of controller, 20; and that is controlled by said CPU in particular functions controls the communications of said control information bus means. Said communications are conducted in a contention fashion, well known in the art.

Signal processor, 200, is the basic SPAM control apparatus of the station of FIG. 7 and and has means for communicating control information (from its controller, 20) and SPAM messages (from its controller, 12) with each of said decoders and their associated apparatus. Signal processor, 200, communicates control information directly with decryptors, 224 and 231, signal stripper, 229, signal generator, 230, microcomputer, 205, and matrix switch, 259. Via matrix switch, 259, signal processor, 200, has means for communicating control information individually to all other controlled apparatus including satellite earth station, 250; satellite receiver circuitry, 251; converter boxes, 201 and 222; other input apparatus, 252; radio tuner & amplifier, 213; TV tuner, 215; television recorder/player, 217; audio recorder/player, 255; computer memory unit, 256; other intermediate apparatus, 257; the TV monitor apparatus, 202M, of TV set, 202; the speaker apparatus of radio, 209; printer, 221; speaker system, 263; and other output system, 261. In addition, the aforementioned SPAM decoders at those of said other controlled apparatus where there are SPAM decoders have capacity for communicating with each of said other controlled apparatus by means of said matrix switch, 259, in a fashion described more fully below. Signal processor, 200, controls matrix switches, 258 and 259, and has means for communicating switch control instructions to said switches, 258 and 259. (FIG. 7 also shows capacity whereby microcomputer, 205, can communicate switch control instructions to said switches, 258 and 259; said capacity is intended to suggest that microcomputer, 205, may control said switches, 258 and 259, at stations that lack a signal processor, 200--for example, stations that are not configured and preprogrammed to generate and/or display/output combined medium programming.)

Microcomputer, 205, controls apparatus of the station of FIG. 7 in accordance with the preprogrammed instructions of the subscriber of said station. Microcomputer, 205, has means for controlling window opening and closing means, 208, furnace, 206, air conditioning system, 207, and other controlled apparatus, 260. Microcomputer, 205, has capacity to communicate control information (under control of signal processor, 200) with other selected apparatus of the station of FIG. 7 by means of matrix switch, 259.

In the spirit of the present invention, signal processor, 200, enables local apparatus of the station of FIG. 6 to process and/or display/output received programming and SPAM information in accordance with the intentions of the owners and suppliers of said programming and information (who may, for example, wish to be paid for use of their programming). Simultaneously, the apparatus of said station are configured and microcomputer, 205, is preprogrammed to process and/or display/output said supplied programming and information in accordance

with the demands of said subscriber. Local input, 225, has capacity to input control instructions to signal processor, 200, and enables the subscriber of the station of FIG. 7 to manually input control instructions at any relevant time. Microcomputer, 205, also has capacity to input control information (under control of signal processor, 200) to signal processor, 200, which enables microcomputer, 205, at any relevant time, to automatically input control information that reflects particular instructions of said subscriber that are preprogrammed at microcomputer, 205.

(This is only a representative group of equipment; many other types of input, intermediate, output, controlled, and meter apparatus could be included in FIG. 7.)

Features, benefits, and modes of operation of the station of FIG. 7 are demonstrated in the following individual examples.

More Regarding the Preferred Controller of a SPAM Decorder

The controller, 39, 44, or 47, of any given SPAM decoder (such as, for example, the decoder, 203, associated with microcomputer, 205) has capacity for communicating information from the matrix switch, 39I, of said decoder to matrix switch, 259, and for receiving information from matrix switch, 259, at the decryptor, 39K, buffer, 39G, and control processor, 39J. Said control processor, 39J, also has capacity to communicate particular switch request information to the controller, 20, of signal processor, 200, directly via the aforementioned control information bus means. In addition, said control processor, 39J, has particular SPAM-control-information-matrix-switch-connection register memory at which said control processor, 39J, retains information that identifies the particular station apparatus to which matrix switch, 259, connects said matrix switch, 39I.

Automating U.R. Stations . . . Regulating Station Environment

FIG. 7A illustrates methods for regulating automatically the environment of subscriber stations such as homes and offices. Particular SPAM regulating messages are embedded in one or more television program channels that are inputted to signal processor, 200, and cable converter box, 201. Said messages include weather bulletin messages that convey local weather information and instructions, including, for example, current outside temperature information, arometric readings, and forecast data. Said messages also include meter reading messages that cause meter records of subscriber station utilities meters to be transmitted to remote metering stations.

Each subscriber station microcomputer, 205, is preprogrammed with particular weather condition instructions that control selected subscriber station apparatus under alternate weather conditions such as, for example, forecast rain instructions, forecast no rain instructions, forecast warming instructions, and forecast cooling instructions. And each subscriber station signal processor, 200, is preprogrammed at its controller, 20, with particular meter reading instructions.

Each subscriber station signal processor, 200, operates continuously; scans all incoming channels sequentially at its switch, 1, and mixer, 3, as described in

example #5 above; is preprogrammed at its controller, 20, to cause its apparatus to tune to a particular master channel at a particular master-control time; and is preprogrammed at the controller, 39, of its decoder, 30, and at its controller, 12, to transfer to the decoder, 203, of the microcomputer, 205, of its station any detected SPAM message with an instance of particular URS-205 execution segment information (which information is different from the execution segment information of the combining synch commands of the "Wall Street Week" example). Said controller, 39, is also preprogrammed to transfer to said controller, 20, via control transmission means, any detected SPAM message with an instance of particular URS-200 execution segment information (which information is different from the execution segment information of any encrypted combining synch commands of the "Wall Street Week" example).

The master-control time preprogrammed at the controller, 20, of the station of FIGS. 7 and 7A is daily at 2:32 AM, 10:32 AM, and 6:32 PM.

At 6:32 PM on Feb. 27, 1988, receiving particular time information from the clock, 18, of said signal processor, 200, causes said controller, 20, to cause the switch, 1, and mixer, 3, of said signal processor, 200, to input the transmission of said master channel to the decoder, 30, of said signal processor, 200, and to cause said decoder, 30, to clear all information of any SPAM message from memory and commence processing to detect a SPAM end of file signal.

In due course, the computer, 73, of the station of FIG. 6 causes an end of file signal to be embedded in the normal transmission location of said master channel, causing the control processor, 39J, of said decoder, 30, to commence waiting to detect a SPAM header.

Then said computer, 73, causes the embedding in said location and the transmission of a particular Weather-Bulletin-125 SPAM message that consists of a "01" header, an execution segment of said URS-205 execution segment information, a meter-monitor segment that contains Weather-Bulletin-125 identification information that distinguishes said Weather-Bulletin-125 from all other weather bulletins, appropriate padding bits, an information segment that contains particular current temperature thirty-two degrees centigrade, forecast rain, and forecast cooling to twenty-one degrees centigrade information, and an end of file signal.

Said message is detected at said decoder, 30, and inputted to said controller, 39, in the above described fashion.

Receiving said message causes said controller, 39, to execute particular preprogrammed controlled function instructions that cause said controller, 39, to locate said Weather-Bulletin-125 identification information and determine that said information does not match particular information at particular last-weather-bulletin-identification RAM at said controller, 39; to input said message to the buffer/comparator, 8, of said signal processor, 200; to retain information of said Weather-Bulletin-125 identification information at said last-weather-bulletin-identification RAM; and to input particular step-completed information to said controller, 20.

(Receiving said step-completed information causes controller, 20, to

cause said switch, 1, mixer, 3, and decoder, 30, to commence functioning to identify program unit identification signal information in the fashion described in example #5.)

Receiving said Weather-Bulletin-125 message causes buffer/comparator, 8, to input said message to controller, 12.

Receiving said message causes said controller, 12, to execute particular preprogrammed controlled function instructions that cause said controller, 12, to transfer said message to decoder, 203. Automatically, controller, 12, determines that said message is addressed to URS microcomputers, 205; compares particular preprogrammed to-203 information to the information at its particular SPAM-7 control-information-matrix-switch-connection-@12 register memory (which memory serves the same function as the aforementioned SPAM-control-information-matrix-switch-connection register memory at each SPAM decoder of the station of FIG. 7). A match results which signifies that the switches of matrix switch, 259, are configured in such a way that the input to switch, 259, that receives the output of controller, 12, is switched to transfer information to the output of switch, 259, that inputs to the buffer, 39G, of decoder, 203. Resulting in a match causes controller, 12, to transfer said Weather-Bulletin-125 SPAM message to matrix switch, 259, which causes matrix switch, 259, to input said message to said buffer, 39G, and causes said buffer, 39G, to input said message, in a fashion well known in the art, to control processor, 39J.

Receiving said Weather-Bulletin-125 SPAM message causes decoder, 203, to to execute the information of the information segment of said message as a machine language job. Automatically, control processor, 39J, executes particular preprogrammed Weather-Bulletin controlled function instructions that cause said control processor, 39J, to locate the Weather-Bulletin-125 identification information of said message; to determine that said information does not match particular information at particular last-weather-bulletin-identification RAM associated with said control processor, 39J; to input the information of the information segment of said message to the CPU of microcomputer, 205; to retain information of said Weather-Bulletin-125 identification information at said last-weather-bulletin-identification RAM; and to cause said CPU to execute the information so inputted as a machine language job.

So executing said information causes microcomputer, 05, to reducing the power usage of said air conditioning system, 207, causes any open windows at said station to be closed. Automatically, microcomputer, 205, interrogates air conditioning system, 207, in a predetermined fashion well known in the art; determines that the thermostat setting at said system, 207, is a particular maintain-22-degrees-centigrade setting and that the thermostat is programmed to cause said system, 207, to cease operating when the thermometer of said thermostat reads twenty-one degrees centigrade; computes particular a particular cease-operating-at-22-degrees-centigrade temperature that reflects the forecast drop in temperature; transmits said instructions of said temperature to said system, 207, thereby reducing the power usage of said system, 207, by causing said thermostat, thenceforth, to cause said system, 207, to cease operating when the thermometer of said thermostat reads twenty-two degrees centigrade; so-called "chains to", in a fashion well known in the art, the aforementioned forecast rain instructions; and executes said instructions. Executing said forecast rain instructions causes

microcomputer, 205, to cause window opening and closing means, 208, to close any open windows (and could cause the aforementioned other controlled apparatus, 260, which could be an automatic lawn watering system to cease watering).

Simultaneously, by transmitting said Weather-Bulletin-125 SPAM message to other subscriber stations of its field distribution system, 93, the station of FIG. 6 causes other subscriber stations to function in the fashion of the station of FIG. 7.

In this fashion, SPAM messages can control and regulate the operation of individual subscriber station controlled apparatus (the thermostat control of furnace, 206, for example, could be similarly controlled) and control and regulate controlled apparatus at pluralities of stations.

(TV signal decoder, 203, has capacity, itself, to detect said Weather-Bulletin-125 SPAM message but only when TV set, 202, is on and operating and when the frequency of said master channel is the one TV channel transferred by box, 201, to TV set, 202. Accordingly, decoder, 203, may receive said message more than once. For this reason, decoder, 203, is preprogrammed to load and execute the information segment only once. Receiving said message a second time causes the control processor, 39J, of decoder, 203, to execute the aforementioned Weather-Bulletin controlled function instructions, and said instructions cause said control processor, 39J, to locate the aforementioned Weather-Bulletin-125 identification information in said message and determine that said information matches the aforementioned information of said Weather-Bulletin-125 identification information retained at particular last-weather-bulletin-identification RAM associated with said control processor, 39J. So matching causes said control processor, 39J, under control of said controlled function instructions to discard the information of said message by transferring the information segment to the null output of the matrix switch, 39I, of said decoder, 203, and deleting all information of said message at the SPAM-input-signal memory of said control processor, 39J.)

(No other SPAM decoder at the station of FIG. 7 is preprogrammed with SPAM-controlled-function-invoking information that matches said URS-205 execution segment information. SPAM decoders of said station such as, for example, the decoder, 218, of video recorder/player, 218, may detect said Weather-Bulletin-125 SPAM message, but doing so will cause said decoders to discard said message because the execution segment information of said message with fail to match any SPAM-controlled-function-invoking information.)

A second example illustrates the capacity of signal processor, 200, for interrogating receiver station utilities meters (as shown in FIG. 7A), recording so-called "readings," and transmitting said readings to remote stations.

The next day, Feb. 28, 1988 at 2:32 AM, receiving particular time information from said clock, 18, causes said controller, 20, again to cause said switch, 1, and said mixer, 3, to input the transmission of said master channel to said decoder, 30, and to cause said decoder, 30, to commence processing to detect a SPAM end of file signal.

In due course, the computer, 73, of the station of FIG. 6 causes an end

of file signal to be transmitted, causing the control processor, 39J, of said decoder, 30, to commence waiting to detect a SPAM header.

Then said computer, 73, causes the embedding and transmission of a particular Read-Meters-of-Selected-Stations SPAM message that consists of a "01" header, an execution segment of said URS-200 execution segment information, a meter-monitor segment that contains Meter-Reading-of-2/28/88 identification information that distinguishes said Read-Meters-of-Selected-Stations SPAM message from all other meter reading messages, appropriate padding bits, an information segment that contains particular determine-if-station-I.D.-is-in-particular-range instructions and particular if-so-read-meter-262 instructions, and an end of file signal.

Said message is detected at said decoder, 30, and inputted to the controller, 39, of said decoder, 30.

Receiving said message causes said controller, 39, to transmit said Read-Meters-of-Selected-Stations SPAM message to the controller, 20, of the signal processor, 200, of said station. Automatically, controller, 39, executes particular preprogrammed controlled function instructions that cause said controller, 39, to locate said Meter-Reading-of-2/28/88 identification information and to transmit a particular readmeter instruction and information of said Meter-Reading-of-2/28/88 identification information to said controller, 20. Receiving said instruction and information causes controller, 20, to determine that said Meter-Reading-of-2/28/88 information does not match particular information at particular last-meter-reading-identification RAM at said controller, 20, and to transmit a particular transmit-to-20 instruction to said controller, 39. Receiving said instruction causes said controller, 39, to transmit said message to said controller, 20, via control information transmission means and to commence waiting for the header of a subsequent SPAM message.

Receiving said Read-Meters-of-Selected-Stations message causes said controller, 20, to execute the information of the information segment of said message as a 0 , executes particular job. Automatically, said controller, 20 preprogrammed load-and-execute controlled function instructions that cause said controller, 20, to input the information of the information segment of said message to the CPU of controller, 20, to retain information of said Meter-Reading-of-2/28/88 identification information at said last-meter-reading-identification RAM, and to cause said CPU to execute the information so inputted as a machine language job.

So executing said information causes controller, 20, under control of said determine-if-station-I.D.-is-in-particular-range instructions, to locate at ROM, 21, the unique digital code information that identifies the station of FIG. 7 uniquely and to determine that the numeric value of said information is greater than a particular lower range limit of said instructions and less than a particular upper range limit. So determining causes controller, 20, to execute said if-so-read-meter-262 instructions.

(At any station where a controller, 20, determines that the numeric value of the unique digital code information that identifies said station is less than said lower limit or greater than said upper limit, so determining causes said controller, 20, to discard all information of

said message, except information at the last-meter-reading-identification RAM of said station, and to commence processing in the conventional fashion.)

Executing said instructions causes controller, 20, first, to determine whether a communications link exists between controller, 20, and utilities meter, 262. Automatically, controller, 20, compares particular preprogrammed to-262 information to the information at its particular SPAM-control-information-matrix-switch-connection@20 register memory (which memory serves the said function at controller, 20, that a SPAM-control-information-matrix-switch-connection register memory serves at each SPAM decoder of the station of FIG. 7). No match results which signifies that the switches of matrix switch, 259, are configured to transfer the input from controller, 20, to switch, 259, to apparatus different from utilities meter, 262. Not resulting in a match causes controller, 20, to input a particular preprogrammed switch-to-262 instruction to the aforementioned control processor, 20A.

Receiving said instruction causes control processor, 20A, to establish a transmission link between controller, 20, and meter, 262. Automatically, control processor, 20A, executes particular instructions, preprogrammed at the aforementioned appropriate RAM and ROM located with said processor, 20A, and under control of said instructions, causes matrix switch, 259, to configure its switches in such a way that the input to switch, 259, from controller, 20, is switched to transfer information to the output of switch, 259, that inputs to meter, 262--thereby establishing said link between controller, 20, and meter, 262--and to transfer a particular to-262 instruction to said controller, 20.

Receiving said to-262 instruction causes controller, 20, in a predetermined fashion, to place particular to-262 information at said particular SPAM-control-information-matrix-switch-connection-@20 register memory then to execute particular ones of said if-so-read-meter-262 instructions.

Executing said ones causes controller, 20, to transmit the current reading information of utilities meter, 262, to a remote metering station computer and cause said computer to process said information. Automatically, controller, 20, transmits particular instructions, via said transmission link, to meter, 262, thereby causing meter, 262, to transmit its particular THIS-READING information (which is the current reading information of said meter), via said said transmission link, to controller, 20; activates telephone connection, 22; inputs a particular telephone number (which number is preprogrammed among said ones) to auto dialer, 24, causing said dialer, 24, to dial said number; establishes a telephone communication link with a particular remote metering station computer in the fashion described above; and transmits said THIS-READING information and information of the aforementioned unique digital code that identifies the station of FIG. 7 uniquely to said computer, in a fashion well known in the art, causing said computer to process said information as particular meter reading information of said station and to respond by transmitting to said controller, 20, via said link, particular reading-received information.

Receiving said reading-received information causes controller, 20, to deactivate telephone connection, 22, to discard all information of said Read-Meters-of-Selected-Stations SPAM message, except information at the

last-meter-reading-identification RAM of said station, and to commence processing in the conventional fashion.

(In an alternate meter reading fashion, said if-so-read-meter-262 instructions are permanently preprogrammed at ROM, 21, and receiving particular day-of-month and time information from clock, 18, causes said controller, 20, at a particular time each month, to execute said instructions, causing the transmission of meter reading information of said meter, 262, said remote metering station, in the above fashion, and the processing of said information at said station. Each station of the field distribution system, 93, of an intermediate station such as FIG. 6 is preprogrammed to function in this fashion at a different time over the course of a month, and all stations transmit meter reading information during said month.)

(No SPAM decoder at the station of FIG. 7 other than said decoder, 30, is preprogrammed with SPAM-controlled-function-invoking information that matches said URS-200 execution segment information. Thus, while a SPAM decoder such as, for example, decoder, 203 or 218, may detect said Read-Meters-of-Selected-Stations SPAM message, doing so will cause said decoder to discard said message.)

AUTOMATING U. R. STATIONS . . . COORDINATING A STEREO SIMULCAST

FIG. 7B illustrates automatic control of one kind of combined medium presentation--a stereo simulcast.

(In the present invention, turning on or changing a channel at a receiver, 215, of a television set, 202, causes apparatus at said receiver automatically to transmit an interrupt signal of new-channel-input information and input said interrupt signal directly to the control processor, 39J, of the controller, 39, of the decoder, 203, associated with said receiver, 215, [which signal said apparatus has means to input directly].)

At the station of FIG. 7 and 7B, a subscriber decides to watch a particular television program the audio of which is stereo simulcast on a local radio station, in a fashion well known in the art. Said subscriber switches power on to TV set, 202, and manually selects the proper channel, which is, for example, channel 13, at the television tuner, 215, of said set, 202, thereby display of the video and audio information of the transmission of said channel.

Switching power on to said set, 202, and tuning said tuner, 215, in this fashion causes said tuner, 215, to input an interrupt signal of new-channel-input information to the control processor, 39J, of the controller, 39, of TV signal decoder, 203, and to commence inputting the demodulated transmission of said channel to said decoder, 203.

Receiving said interrupt signal causes said control processor, 39J, to cause all apparatus of decoder, 203, to cease receiving television transmission information and to delete all previously received SPAM information (and, in so doing, to set the information at the EOFS WORD Counter of the EOFS valve, 39F, of said controller, 39 to "00000000", thereby discarding any previously received end of file signal information); to cause the matrix switch, 39I, to commence transferring information from EOFS valve, 39F, to its null output; to cause EOFS

valve, 39F, to commence processing detected SPAM information for an end of file signal; and to cause all apparatus of decoder, 203, to commence receiving television transmission information.

Then so inputting said demodulated transmission to said decoder, 203, causes said decoder, 203, to commence detecting and processing SPAM message information embedded in said transmission.

In due course, the program originating studio that originates the transmission of said channel embeds an end of file signal in said transmission, causing the EOFS valve, 39F, of said controller, 39, to detect said signal and transfer an interrupt signal of EOFS-signal-detected information to the control processor, 39J, of said controller, 39.

Receiving said interrupt signal at said control processor, 39J, causes said control processor, 39J, to process the next received SPAM information as information of the header of a SPAM message, thereby causing said controller, 39, to commence identifying and processing the individual SPA.M messages of said detected SPAM information.

Periodically thereafter, said program originating studio embeds in said transmission and transmits a particular Tune-Radio-to-FM-104.1 SPAM message that consists of a "01" header, an execution segment of particular activate-simulcast information that is addressed to URS radio decoders, 210, a meter-monitor segment that contains the "program unit identification code" information of said particular television program, appropriate padding bits, an information segment that contains particular 104.1-MHz information, and an end of file signal.

Said message is detected at said decoder, 203, and inputted to said controller, 39, in the above described fashion.

Receiving said message causes said controller, 39, to execute particular preprogrammed controlled function instructions that cause said controller, 39, to transfer said message to the radio decoder, 210, of radio, 209. First, said controller, 39, determines whether a transmission link exists between said controller, 39, and said controller, 44. Automatically, said controller, 39, compares particular preprogrammed to-210 information to the information at its particular SPAM-control-information-matrix-switch-connection register memory. No match results which signifies that the switches of matrix switch, 259, are configured to transfer the input to switch, 259, from said controller, 39, to apparatus other than radio decoder, 210. Not resulting in a match causes said controller, 39, to input a particular preprogrammed switch-203-to-210 instruction to the aforementioned control processor, 20A, via the aforementioned control information bus means for communicating particular switching request control information.

Receiving said instruction causes control processor, 20A, to establish a transmission link between the controller, 39, of decoder, 203, and the controller, 44, of decoder, 210. Automatically, under control of particular preprogrammed instructions, control processor, 20A, causes matrix switch, 259, to configure its switches in such a way that the input to switch, 259, from the controller, 39, of decoder, 203, is switched to transfer information to the output of switch, 259, that inputs to the buffer, 44G, of the controller, 44, of said decoder, 210,

(said controller, 44, being identical to the controller, 39, of FIG. 3A, but the alphanumeric designation of the components of said controller, 44, being designated with a "44" rather than a "39" number)--thereby establishing said transmission link--and to transfer a particular to-210 instruction to said controller, 39.

Receiving said to-210 instruction causes said controller, 39, in a predetermined fashion, to place to-210 information at said SPAM-control-particular information-matrix-switch-connection register memory then to execute particular ones of said controlled function instructions.

Executing said ones causes said controller, 39, to transfer said message to the radio decoder, 210, of radio, 09. Automatically, the control processor, 39J, of said decoder, 203, causes the matrix switch, 39I, to commence transferring information to matrix switch, 259, and causes the apparatus of controller, 39, in the fashion for transferring a "01" header message described above, to transfer said Tune-Radio-to-FM-104.1 SPAM message, via said communications link, to the controller, 44, of said decoder, 210.

Receiving said SPAM message causes said controller, 44, switch power on to and tune radio, 209, to the frequency, 104.1 MHz. (Controller, 44, has means for transmitting control information from its matrix switch, 44I, to a particular switch, 212, and a particular digital tuner, 213, that are digitally actuated apparatus, well known in the art, that have capacity, respectively, for switching power on to radio, 209, and for tuning radio, 209.) Automatically, the control processor, 44J, of said controller, 44, executes particular preprogrammed activate-simulcast controlled function instructions, loads said 104.1-MHz information of the information segment of said message at particular tune-to working register memory, and determines that the information at said working memory does not match information at particular SPAM-is-tuned-to register memory (which signifies that radio, 209, is not tuned to the radio frequency, 104.1 MHz). Not resulting in a match causes said controller, 44, to determine, in a predetermined fashion, that radio, 209, is not on and operating. So determining causes said controller, 44, under control of said instructions, to transmit particular preprogrammed instructions, via said matrix switch, 44I, to switch, 212, thereby causing said switch, 212, to switch on and actuate radio, 209; to transmit particular preprogrammed instructions, via said matrix switch, 44I, to tuner, 213, thereby causing said tuner, 213, to tune radio, 209, to said frequency, 104.1 MHz; and to place information of said 104.1-MHz information at said SPAM-is-tuned-to register memory. Automatically, the speaker apparatus of said radio, 209, commences receiving information of the radio transmission of said frequency and emitting the audio sound of said simulcast.

Thus switching power on to TV set, 202, and selecting channel 13 at television tuner, 215, are the only manual steps necessary to actuate the radio simulcast of said channel at radio, 209.

In addition, because the station of FIG. 7 (and FIG. 7B) is preprogrammed to collect monitor information, receiving said Tune-Radio-to-FM-104.1 SPAM message also causes the transmission of monitor information to the onboard controller, 14A, of said signal processor, 200, in the fashion of example #3 above. At decoder, 203,

completing the controlled functions invoked by receiving said message causes the transfer, via the aforementioned bus means for communicating monitor information, to said onboard controller, 14A, of a first information transmission of the execution and meter-monitor information of said message with particular first source mark information that identifies TV set, 202. At decoder, 210, completing the controlled functions invoked by receiving said message causes the transfer, via said bus means, to said onboard controller, 14A, of a second information transmission of the execution and meter-monitor information of said message with appropriate source mark information identifying radio, 209.

In the fashion of example #3 above, receiving said first transmission of monitor information causes said onboard controller, 14A, to cause a signal record of prior programming of TV set, 202, to be recorded at the recorder, 16, of signal processor, 200, (and may cause records to be transferred to a remote location) and causes said onboard controller, 14A, to initiate a first signal record, associated with source mark information that identifies TV set, 202, that is based on the "program unit identification code" information of said particular television program in the meter-monitor information of said Tune-Radio-to-FM-104.1 SPAM message.

In the same fashion, receiving said second transmission of monitor information causes said onboard controller, 14A, to cause a signal record of prior programming of radio, 209, to be recorded at the recorder, 16, of signal processor, 200, (and may cause records to be transferred to a remote location) and causes said onboard controller, 14A, to initiate a second signal record, associated with source mark information that identifies radio, 209, that is based on said "program unit identification code" of said Tune-Radio-to-FM-104.1 SPAM message. However, to minimize unnecessary duplication, in a predetermined fashion, onboard controller, 14A, determines that TV set, 202/decoder, 203, is the principal source of information associated with said "program unit identification code"; retains information of said "program unit identification code" in said second signal record together with information that identifies said second record as a secondary record of said first signal record; and retains information at said first signal record that identifies radio, 209/decoder, 210, as a secondary source of monitor information associated with said "program unit identification code." In so doing, onboard controller, 14A, consolidates signal record information of two different monitor information transmissions that contain different source mark information but common "program unit identification code" information.

(If receiving said Tune-Radio-to-FM-104.1 SPAM message causes decryption at decoder, 203, as receiving the first message of example #4 caused decryption, receiving said Tune-Radio-to-FM-104.1 SPAM decoder, 203, causes, in the fashion of example #4, the decrypting of said message at decoder, 203, and thereafter, the processing of the unencrypted information of said message. Said processing includes 0 processing at signal processor, 200, as in example #4, of meter and monitor information transferred from decoder, 203. Said processing includes the transmitting of unencrypted information of said message from decoder, 203, to decoder, 210; the execution of the controlled functions invoked at decoder, 210, by receiving said message; the transmission of monitor information of said message, in the fashion of example #3, from decoder, 210, to signal processor, 200. and the processing of said monitor information at signal o processor, 200, in the fashion of example #3.)

(In the present invention, switching power on to a radio, 209, or changing a frequency at a radio, 209, causes apparatus at said radio, 209, automatically to transmit an interrupt signal of new-frequency-input information and input said interrupt signal directly to the control processor, 44J, of the controller, 44, of the decoder, 210, associated with said radio, 209 [which signal said apparatus has means to input directly].)

Switching power on to said radio, 209, and tuning radio, 209, to said frequency, 104.1 MHz, causes decoder, 210, to commence processing SPAM message information in the transmission of said frequency. In the fashion of TV set, 202, and decoder, 203, above, switching on and tuning radio, 209, causes said radio, 209, to input an interrupt signal of new-frequency-input information to the control processor, 44J, of the controller, 44, of radio decoder, 210, and to commence inputting the received transmission of said frequency to said decoder, 210, (which decoder, 210, does not include the radio receiver circuitry, 41, of FIG. 2B because the transmission input decode, 210, is the transmission already received by the receiver circuitry of radio, 209, and which input is input directly to the radio decoder, 42, apparatus of said decoder, 210).

In the same fashion, receiving said interrupt signal of new-frequency-input information causes said controller, 4, to delete all previously received SPAM information, to commence processing detected SPAM information for an end of file signal, and to discard all detected SPAM information until and end of file signal is detected.

In due course, the program originating studio that originates the transmission of said frequency embeds an end of file signal in said transmission, causing said controller, 4, to detect said signal and commence identifying and processing the individual SPAM messages of said detected SPAM information.

Periodically thereafter, said program originating studio embeds in said transmission and transmits a particular Activate-Stereo-Output SPAM message that consists of a "01" header, an execution segment of particular activate-speakers information that is addressed to URS signal processors, 200, a meter-monitor segment that contains secondary "program unit identification code" information of the audio program unit of said radio transmission and primary "program unit identification code" information of said particular television program, and appropriate padding bits, an information segment that contains information of television channel 13 and radio frequency 104.1 MHz, and an end of file signal.

Said message is detected at said decoder, 210, and inputted to said controller, 44.

Receiving said message causes said controller, 44, to execute particular preprogrammed controlled function instructions that cause said controller, 44, to transfer said message to the controller, 20, of signal processor, 200. Automatically, said controller, 44, compares particular preprogrammed to-20 information to the information at its particular SPAM-control-information-matrix-switch-connection register memory. No match results which signifies that the switches of matrix switch, 259,

are configured to transfer the input to switch, 259, from said controller, 44, to apparatus different from said controller, 20. Not resulting in a match causes said controller, 44, to input a particular preprogrammed switch-210-to-20 instruction to the aforementioned control processor, 20A, via the aforementioned control information bus means for communicating switching request information.

Receiving said instruction causes control processor, 20A, to establish a control information transmission link between said controller, 44, and said controller, 20. Automatically, under control of particular preprogrammed instructions, control processor, 20A, causes matrix switch, 259, to configure its switches to transfer the input from said controller, 44, to the output of switch, 259, that inputs to said controller, 20--thereby establishing said transmission link--and transfers a particular to-20 instruction to said controller, 44.

Receiving said to-20 instruction causes said controller, 44, to transfer said Activate-Stereo-Output message to said controller, 20. Automatically, in a predetermined fashion, controller, 44, places particular to-20 information at said SPAM-control-information-matrix-switch-connection register memory then executes particular ones of said controlled function instructions. Automatically, under control of said ones, said controller, 44, causes its matrix switch, 44I, to commence transferring information to matrix switch, 259, and causes, in the fashion for transferring a "01" header message described above, transfers said Activate-Stereo-Output SPAM message, via said link, to said controller, 20.

Receiving said SPAM message causes said controller, 20, to determine that certain preconditions are satisfied--more precisely, that TV set, 202, and radio, 209, are tuned, respectively, to the proper television channel and the radio frequency of the stereo simulcast. Automatically, controller, 20, executes particular preprogrammed conditional-speaker-activation controlled function instructions; loads the information of television channel 13 and radio frequency 104.1 MHz of the information segment of said message at particular first and second register memory respectively; causes control processor, 20A, to cause matrix switch, 259, to establish a communications link between controller, 20, and the control processor, 39J, of decoder, determines, in a predetermined fashion, that information of the channel to which TV set, 202, is tuned matches the television channel 13 information at said first register memory; causes control processor, 20A, to cause matrix switch, 259, to establish a communications link between controller, 20, and the control processor, 44J, of decoder, 0; and determines, in a predetermined fashion, that information of the frequency to which radio, 209, is tuned matches the radio frequency 104.1 MHz information at said second register memory. Determining a match with said television channel 13 information and a match with said radio frequency 104.1 MHz information satisfies said certain preconditions and causes controller, 20, to execute particular station-specific-stereo-simulcast instructions.

Station-specific-stereo-simulcast instructions reflect the particular fashion in which the subscriber of any given station wishes to have audio of stereo simulcasts outputted at his station, and preprogrammed station-specific-stereo-simulcast instructions vary from subscriber station to subscriber station.

Executing the particular station-specific-stereo-simulcast instructions of the station of FIGS. 7 and 7C causes the controller, 20, of said station to cause stereo speaker system, 263 to emit the audio sound of said transmission in a particular fashion and causes apparatus of TV set, 202, and of radio, 209, to cease emitting sound. Automatically, controller, 20, transmits switch control information to matrix switch, 258, that causes said switch, 58, to configure its switches in such a way that the programming input to switch, 258, from radio, 209, (which inputs the audio information received at radio, 209) is switched to transfer information to the output of switch, 58, that inputs to speaker system, 263; causes control processor, 20A, to cause matrix switch, 259, to establish a communications link between controller, 20, and speaker system, 263; and causes speaker system, 263, to switch power on and commence operating, in a fashion well known in the art, at a particular so-called "balance" and a particular sound emitting volume. In so doing, controller, 20, causes speaker system, 263, to commence receiving and emitting sound of the audio information of the stereo simulcast radio transmission received at radio, 209, in a particular fashion. Then automatically, under control of said station-specific-stereo-simulcast instructions, controller, 20, causes control processor, 20A, to cause matrix switch, 259, to establish a communications link between controller, 20, and the control processor, 39J, of decoder, 203; causes TV set, 202, in a predetermined fashion, to cease emitting sound of received audio; causes control processor, 20A, to cause matrix switch, 259, to establish a communications link between controller, 20, and the control processor, 44J, of decoder, 210; and causes radio, 209, in a predetermined fashion, to cease emitting sound of received audio. In so doing, controller, 20, causes speaker system, 263, to be the only apparatus of the station of FIG. 7 emitting sound of said stereo simulcast.

(At other stations where said Activate-Stereo-Output SPAM message is received, said certain preconditions may not be satisfied--at one given station, for example, the radio, of may be tuned to radio frequency 104.1 MHz but the TV set, 202, may be tuned to a channel other than television channel 13 which would signify that the subscriber of said station was not viewing a simulcast. Said stations would not execute station-specific-stereo-simulcast instructions. Instead, other instructions would be executed, and said instructions might, for example, merely discard all information of said Activate-Stereo-Output SPAM message. And at stations where station-specific-stereo-simulcast instructions are executed, the executed instructions, which are station specific and vary from station to station, will cause different functioning at different stations. For example, balance and sound emitting volume can vary from station to station, and at some stations, radios, 209, and/or TV sets, 202, may continue emitting sound of received audio.)

Thus, by switching power on to TV set, 202, and selecting channel 13 at television tuner, 215, said subscriber not only actuates automatically the radio simulcast of said channel at radio, 209, but also causes the apparatus of his station automatically to emit the sound of the received audio in his own predetermined fashion.

And automatically, monitor information is collected at signal processor, 200, that reflects the operation of speaker system, 263.

Because the information of said Activate-Stereo-Output SPAM message is transmitted periodically in said radio programming transmission, a subsequent instance of said information is received at speaker system, 263, embedded in the audio information received (via switch, 258) from radio, 209. Receiving said subsequent instance causes the SPAM decoder apparatus associated (in the fashion of the decoder, 285, if FIG. 5) with said speaker system, 263, to detect the Activate-Stereo-Output SPA.M message information of said instance and to transfer to the onboard controller, 14A, of signal processor, 200, via the aforementioned bus means for communicating monitor information, a particular third transmission of monitor information containing the execution and meter-monitor information of said instance, with appropriate source mark information identifying speaker system, 263.

In the fashion described above, receiving said third transmission of monitor information causes said onboard controller, 14A, to cause a signal record of prior programming of speaker system, 263, to be recorded at the recorder, 16, of signal processor, 200, (and may cause records to be transferred to a remote location) and causes said onboard controller, 14A, to initiate a third signal record, associated with source mark information that identifies speaker system, 263, that is based on the aforementioned secondary "program unit identification code" information of the audio program unit of said radio transmission. However, to minimize unnecessary duplication, in a predetermined fashion, onboard controller, 14A, determines that radio, 209/decoder, 210, is the principal source of information associated with said secondary "program unit identification code"; retains information of said secondary "code" in said third signal record together with information that identifies said third record as a subordinate record of the aforementioned second signal record; and retains information at the aforementioned first signal record that identifies speaker system, 263, as a tertiary source of monitor information associated with the "program unit identification code" information of said particular television program. In so doing, onboard controller, 14A, consolidates signal record information of three different monitor information transmissions that contain different source mark information but common "program unit identification code" information.

AUTOMATING U. R. STATIONS . . . RECEIVING SELECTED PROGRAMMING

FIG. 7C illustrates methods for monitoring multiple programming channels, selecting programming and information of interest, and receiving said selected programming and information.

The microprocessor, 205, of the station of FIG. 7 and 7C, is preprogrammed to hold records of a portfolio of stocks and to receive and process automatically news items about said stocks and about the industries of said stocks. The signal processor, 200, of said station is preprogrammed at the RAM associated with the control processor, 39J, of the controller, 39, of its decoder, 30, with particular news-items-of-interest information that includes identification information of the particular stocks in said portfolio and at its controller, 20, with particular cause-selection instructions that control said controller, 20, in selecting transmissions of news items of interest.

One company whose stock is preprogrammed at said microprocessor, 205, is

the American Telephone and Telegraph Company whose stock is identified by particular binary information of "T". And among the news-items-of-interest information at said RAM is an instance of said binary information of "T".

Two remote stations--remote news-service-A station and remote news-service-B station--transmit, from geographically separate locations, two different broadcast print transmissions.

The intermediate transmission station of FIG. 6 receives and retransmits information the transmissions of said remote stations on digital data channels A and B, respectively, that are inputted to converter boxes, 222 and 201, and to signal processor, 200. (Other intermediate stations receive and retransmit information of said transmission on other channels.)

Each remote station transmits each particular news item within the particular format of a Transmit-News-Item SPAM message, and receiving any given message in a Transmit-News-Item SPAM message format causes the computer, 73, of any given intermediate transmission station to transmit a particular Select-News-Item message a particular preprogrammed number of times in a particular Select-Digital-News-Item message format then to transmit the information of said news items within a message that is transmitted particular Specific-Digital-News-Item message format.

In due course, said remote news-service-A station transmits a particular AT&T news item in a particular Transmit-AT&T-News-Item message that is in said Transmit-News-Item SPAM message format and that consists of an "01" header, an execution segment of particular transmit-news-message information that is addressed to ITS computers, 73, a meter-monitor segment that contains the "program unit identification code" information of said AT&T news item and subject matter information of said binary information of "T", appropriate padding bits, an information segment that contains said AT&T news item, and an end of file signal.

Receiving said Transmit-AT&T-News-Item message causes the computer, 73, of the station of FIG. 6 to transmit a particular preprogrammed number of times on digital data channel A a particular Select-AT&T-News-Item message then to transmit a particular Specific-AT&T-News-Item message. (Receiving said Transmit-AT&T-News-Item message causes a computer, 73, at each one of said other intermediate transmission stations to cause the transmission of similar messages on a selected channel a each of said stations.) Said Select-AT&T-News-Item message is in said Select-Digital-News-Item message format and consists of an "01" header; an execution segment of particular select-news-item information that is addressed to URS signal processor, 200; a meter-monitor segment that consists of the meter-monitor information of said Transmit-News-Item SPAM message plus information that identifies said intermediate station (the format information of said meter-monitor information being modified to reflect the addition of said information that identifies said station); appropriate padding bits; an information segment that contains the binary information of "T" information of said subject matter information; and an end of file signal. The particular number of times that any given intermediate station transmits said message is the number of times necessary to permit apparatus of a signal processor, 200, at each subscriber station of said intermediate station, functioning in the fashion of example #5, to detect and process at least one instance of

said Select-AT&T-News-Item message and to permit apparatus each station then to tune to the transmission of a selected digital data channel and receive, in the fashion described below, said Specific-AT&T-News-Item message message. And said Specific-AT&T-News-Item message is in said Specific-Digital-News-Item message format consists of an "01" header; an execution segment of particular process-news-item information that is addressed to URS microcomputers, 73; a meter-monitor segment that is identical to the meter-monitor segment of said Select-AT&T-News-Item message; appropriate padding bits; an information segment that contains the information of said AT&T news item; and an end of file signal.

At the station of FIG. 7 and 7C, signal processor, 200, scans sequentially all channels at its switch, 1, mixer, 3, and decoder, 30, in the fashion of example #5.

In due course, one instance of said Select-AT&T-News-Item message is detected at said decoder, 30, and inputted to the controller, 39, of said decoder, 30.

Receiving said Select-AT&T-News-Item message causes said controller, 39, to transmit said message to the controller, 20, of said signal processor, 200. Automatically, controller, 39, executes particular preprogrammed controlled function instructions that cause said controller, 39, to load the binary information of "T" information of the information segment of said message at particular working register memory and determine that the information at said memory matches the aforementioned binary information of "T" that is among the news-items-of-interest information at the RAM associated with control processor, 39J. Determining a match causes said controller, 39, to transmit said message, with channel mark information that identifies the particular channel in which said message was embedded, to said controller, 20, via control information transmission means and to continue functioning in the fashion of example #5.

Receiving said message causes said controller, 20, to cause a selected cable converter box, 222, to receive the transmission identified by said channel mark; to cause All signal decoder, 290, (which is identical to the TV signal decoder of FIG. 2A with the added capacity of the radio signal decoder of FIG. 2B to receive, detect, and input SPAM information embedded in radio frequency transmissions to a controller, 39, plus the added capacity of the other signal decoder of FIG. 2C to receive, detect, and input SPAM information embedded in other frequency transmissions to said controller, 39) at microcomputer, 205, to receive the transmission of a particular television frequency transmission and to commence processing detected SPAM information for an end of file signal; and to establish a programming transmission link between said selected box, 222, and All signal decoder, 290, at microcomputer, 205. Automatically, controller, 20, executes the instructions of a particular preprogrammed controlled function (that is different from the function invoked by said message at said controller, 39). Automatically, controller, 20, establishes a control information transmission link between controller, 20, and the tuner, 223, of said selected box, 222, by inputting a particular instruction to control processor, 20A, that causes control processor, 20A, to cause matrix switch, 259, to configure its switches in such a way that its input from controller, 20, is switched to its output that inputs to said tuner, 223. Then receiving a particular to-223 instruction from said control processor, 20A, causes controller, 20, to transmits particular instructions, via said control information

transmission link, to said tuner, 23, thereby causing said tuner, 223, to tune its associated cable converter box, 222, the to the particular channel transmission of said multi-channel cable transmission that is identified by said channel mark. Automatically, controller, 0, establishes a control information transmission link between controller, 20, and said decoder, 290, by inputting a particular instruction to control processor, 20A, that causes control processor, 20A, to cause matrix switch, 259, to configure its switches to transfer information from its input from controller, 20, to its output that inputs to said decoder, 290. Then receiving a particular to-290 instruction from said control processor, 20A, causes controller, 20, to input an interrupt signal of new-channel-input information, in a predetermined fashion, to the control processor, 39J, of the controller, 39, of said decoder, 290. Receiving said interrupt signal causes said control processor, 39J, to delete all previously received SPAM information; to cause its associated matrix switch, 39I, to commence transferring information from the EOFS valve, 39F, to its null output; and to cause said EOFS valve, 39F, to commence processing detected SPAM information for an end of file signal. Then automatically, controller, 20, inputs switch control instructions to matrix switch, 258, thereby causing matrix switch, 258, to configure its switches in such a way that the input to switch, 258, from cable converter box, 222, is switched to transfer information to the output of switch, 258, that inputs to said decoder, 290. In so doing, controller, 20, causes said decoder, 290, to commence receiving the programming transmission of digital data channel A and causes said decoder, 290, to commence detecting and processing SPAM message information embedded in said transmission.

In due course, a subsequent instance of said Select-AT&T-News-Item message is transmitted on said channel A, causing the EOFS valve, 39F, of said decoder, 290, to detect the end of file signal of said message and causing the controller, 39, of said decoder, 290, to commence identifying and processing the individual SPAM messages detected in the transmission of said channel A. (Said decoder, 290, is not preprogrammed with any controlled-function-invoking information that matches the execution segment information of a said Select-AT&T-News-Item message, so receiving any given instance of said message causes decoder, 290, merely to discard said message.)

In due course, said Specific-AT&T-News-Item message is transmitted on said channel A.

Transmitting said message causes decoder, 290, to detect and input said message to the controller, 39, of said decoder, 290.

Receiving said message causes said controller, 39, to cause microcomputer, 205, to process information of said message. Automatically, controller, 39, executes the instructions of a particular preprogrammed controlled function and inputs to an input buffer of microcomputer, 205, a particular input-from-290 computer job that consists of process-this-data-input-from-290 instructions and particular data. Said data includes the meter-monitor information of said message and the information of the information segment of said message--that is, said AT&T news item.

In due course and in a predetermined fashion, microcomputer, 205, processes said job; determines that the preprogrammed instructions

entered by the subscriber of the station of FIG. 7 and 7C are to print at printer, 221, data of any job of process-this-data-input-from-290 instructions; and causes said AT&T news item to be printed at said printer, 221. Automatically, microcomputer, 205, executes particular preprogrammed instructions and inputs a particular switch-205-to-221 instruction to the controller, 20, of signal processor, 200. Receiving said instruction causes said controller, 20, to input particular switch control instructions to matrix switch, 258, thereby causing matrix switch, 258, to configure its switches in such a way that the input to switch, 258, from microcomputer, 205, is switched to transfer information to the output of switch, 258, that inputs to said printer, 221. Then automatically, microcomputer, 205, transfers said data to said printer, 221. In so doing, microcomputer, 205, causes printer, 221, in a predetermined fashion, to print said AT&T news item. (Said preprogrammed instructions entered by the subscriber might cause said microcomputer, for example, then to establish a programming communication link with computer memory unit, 256, and to cause said unit, 256, to record said AT&T news item.)

Receiving the aforementioned instance of said Select-AT&T-News-Item message and said Specific-AT&T-News-Item message at the station of FIG. 7 also causes processing of monitor information at said signal processor, 200, in the fashions described above. After transferring the information of said Select-AT&T-News-Item message to said controller, 20, said controller, 39, automatically transfers monitor information of said message to buffer/comparator, 14, thereby causing the onboard controller, 14A, to process information of the availability at said station of said AT&T news item. After executing the controlled functions invoked by said Specific-AT&T-News-Item message, said controller, 20, automatically transfers monitor information of said message to buffer/comparator, 14, thereby causing the onboard controller, 14A, to process information of the use of said AT&T news item at microcomputer, 205. And receiving said data at printer, 221, causes other decoder, 227 (see FIG. 5), in a predetermined fashion, to detect in said data the meter-monitor information of said Specific-AT&T-News-Item message and to transmit said meter-monitor information to signal processor, 200, thereby causing said onboard controller, 14A, to retain monitor information and initiate a secondary signal record in the fashion described above.

Automating U. R. Stations . . . More on Example #7 . . . Receiving Selected Programming and Combining Selected URS Microcomputers, 205, Automatically to the Computer System of a Selected Programming Transmission

In the present invention, the computer information of any given combined medium combining is processed by a computer system that consists of a plurality of computers each of which is at a subscriber station and all of which process, in parallel, and output their specific information under control of one transmission of embedded computer programming inputted to said system at a program originating studio. The FIG. 1C combining of the "Wall Street Week" example provides one example of such a combining. The computer system of said example consists of a plurality of microcomputers, 205, each of which is at a different subscriber station, and the program originating studio that originates transmission of the "Wall Street Week" programming embeds and transmits a series of SPAM messages that control all of said microcomputers, 205. Under control of the first message, each one of said plurality of microcomputers, 205,

generates its own specific FIG. 1A information. Then, under control of the second message, each of said microcomputers, 205, combines its specific FIG. 1A information with transmitted FIG. 1B information, and all of said microcomputers, 205, display their specific FIG. 1C images (which differ from station to station).

The present invention includes capacity whereby SPAM message information transmitted by any given program originating studio can cause a plurality of selected computers to select programming in the fashion described above, and in so doing, to combine to an come under control of the computer system of said studio.

For example, all URS microcomputers, 205, of a large plurality of subscriber stations (of which the station of FIGS. 7 and 7C is one station) are preprogrammed with particular program-unit-of-interest information and with particular station-specific-television-program-selection-and-display instructions. Said program-unit-of-interest information includes information of particular television programs that the subscribers of the stations of said microcomputers, 205, wish to view when said programs are transmitted. Some among said television programs are combined medium television programs. Said station-specific-television-program-selection-and-display instructions reflect the specific fashion in which any selected one of said programs is to be selected and displayed when said program is transmitted.

The program-unit-of-interest information preprogrammed at the microcomputer, 205, of the station of FIGS. 7 and 7C includes particular specific-WSW information that reflects the wish of the subscriber of said station to view (or record) said "Wall Street Week" program when said program is transmitted. In a predetermined fashion, said subscriber has caused to be included in said program-unit-of-interest information. (Microcomputers, 205, of selected other stations of said large plurality of stations are also so preprogrammed.) The station-specific-television-program-selection-and-display instructions at the microcomputer, 205, of the station of FIGS. 7 and 7C includes particular information that said subscriber will pay up to a certain limit--for example, twenty-five cents--to be permitted to receive said program and that, if the TV set, 202, of said station is switched off when information of the transmission of said program is detected, power should be switched on to said TV set, 202, and said program should be displayed at the monitor, 202M, of said set and, in addition, power should be switched on to the video recorder/player, 217, of said station, and said program should be recorded at said recorder/player, 217.

The signal processor, 200, of said station scans sequentially all received television transmission channels in the fashion described above and is preprogrammed at the RAM associated with the control processor, 39J, of its decoder, 30, to respond in a particular controlled function fashion whenever a SPAM message with an execution segment of particular available-television-program information is detected. Said signal processor, 200, has capacity for actuating and tuning TV set, 202, and video recorder, 217, and for controlling microcomputer, 205.

(The microcomputers, 205, of selected other stations of said large plurality of stations are also preprogrammed with select-WSW information and with station-specific-television-program-selection-and-display instructions [which instructions differ from station to station], and the

signal processors, 200, of said stations are preprogrammed function in the same fashion as the signal processor, 200, of the station of FIGS. 7 and 7C.)

The program originating studio that originates the "Wall Street Week" program originates, embeds, and transmits the programming in the encrypted fashion of example #7 above, and the intermediate transmission station of FIG. 6 receives and retransmits said programming, in the fashion of example #7, on cable channel 13 which is inputted, at the station of FIGS. 7 and 7C, to converter boxes, 222 and 201, and to signal processor, 200. (Other intermediate stations receive and retransmit information of said transmission on other channels, and the aforementioned specific-WSW information [that is included in program-unit-of-interest information] is specified above, in example #7.)

Before transmitting any given program unit of television programming, any given program originating studio transmits a particular intermediate-station-control message in the particular format of a Prepare-To-Retransmit-Television-Program-Unit SPAM message, and receiving any given SPAM message in said format causes the computer, 73, of any given intermediate transmission station to generate a particular series of messages and retain complete information of said messages at particular memory locations, to prepare particular apparatus of said station to retransmit the programming of said program unit, and to transmit said retained messages in a particular fashions at particular times.

The cable program controller & computer, 73, of each intermediate station is preprogrammed with schedule information that reflects the particular time at which and the channel on which said station will retransmit said "Wall Street Week" program. The particular channel information of the computer, 73, of the station FIG. 6 is CC13 and the particular time information is particular-8:30, reflecting that said station is schedule to retransmit said program on cable channel 13 at a particular 8:30 PM time (which is the time at which the program originating studio that originates the "Wall Street Week" program transmits the so-called "live" programming of said program. (A particular other computer, 73, is preprogrammed with particular channel information of CC11 and particular time information of particular-9:30, reflecting that the station of said other computer, 73, is schedule to retransmit said program, so-called "time delayed," on cable channel 11 at a particular 9:30 PM time.)

In due course, the program originating studio that originates the transmission of said "Wall Street Week" program transmits a particular Prepare-To-Retransmit-WSW message (which is the particular intermediate-station-control message of said "Wall Street Week" program) in said Prepare-To-Retransmit-Television-Program-Unit format, and said message consists of an "01" header; an execution segment of particular load-and-execute information that is addressed to ITS computers, 73; a meter-monitor segment that contains the "program unit identification code" information of said "Wall Street Week" program; appropriate padding bits; an information segment of particular incorporate-and-retain-Select-WSW-Program-Unit-SPAM-message instructions that include particular generally applicable please-fully-enable-WSW-on-XXXX-at-YYYYYYYYYYYYYY information and specific-WSW information, particular incorporate-and-retain-Specific-WSW-Enabling-message instructions that include the

aforementioned particular enable-WSW instructions, particular timing instructions that include particular-8:30-PM information, and particular interconnect-and-encrypt-the-audio-of-WSW instructions; and an end of file signal.

Receiving said Prepare-To-Retransmit-WSW message causes apparatus of the station of FIG. 6 to input the information of the information segment of said message to the computer, 73, of said station and to execute the information so inputted as a machine language job. (Receiving said message causes apparatus at other stations to function similarly.)

Executing said incorporate-and-retain-Select-WSW-Program-Unit-SPAM-message instructions causes said computer, 73, to generate particular please-fully-enable-WSW-on-CC13-at-particular-8:30 information and a particular Select-WSW-Program-Unit SPAM message and to retain said message at particular Select-Program-Unit-Message-to-Transmit memory. Automatically, said computer, 73, generates said please-fully-enable-WSW-on-CC13-at-particular-8:30 information by replacing the information of particular variables, XXXX and YYYYYYYYYYYYYYY, in said generally applicable please-fully-enable-WSW-on-XXXX-at-YYYYYYYYYYYYYYY information with said CC13 and said particular-8:30 information that are preprogrammed at said computer, 73, and that reflect that the schedule of the intermediate station of said computer, 73. Said Select-WSW-Program-Unit message consists of an "01" header; an execution segment of information that is identical to the aforementioned available-television-program information; a meter-monitor segment that consists of the meter-monitor information of said Prepare-To-Retransmit-WSW message plus information that identifies said intermediate station (the format information of said meter-monitor information being modified to reflect the addition of said information that identifies said station); appropriate padding bits; an information segment of generally applicable determine-whether-to-select instructions of said Transmit-Select-WSW message that contain said particular specific-WSW information and said please-fully-enable-WSW-on-CC13-at-particular-8:30 information; and an end of file signal.

(The modified meter-monitor format information in said message is preprogrammed in said incorporate-and-retain-Select-WSW-Program-Unit-SPAM-message instructions and is caused, by said instructions, to replace the meter-monitor format information of said Prepare-To-Retransmit-WSW message message to reflect the addition of the aforementioned information that identifies the station of FIG. 6. In other words, a station specific identification datum is added at each station to the meter-monitor information of said Prepare-To-Retransmit-WSW message. The station specific identification data vary from station to station. However, all station specific identification data are in the same format and are added to said meter-monitor information in the same fashion. Hence, all instances of Select-WSW-Program-Unit message meter-monitor information are in the same format.)

(Executing said incorporate-and-retain-Select-WSW-Program-Unit-SPAM-message instructions causes said other computer, 73, that is preprogrammed with particular CC11 and particular-9:30 information to generate particular please-fully-enable-WSW-on-CC11-at-particular-9:30 information that reflects the schedule of the station of said other computer, 73, and to incorporate said information into the information segment of the station specific Select-WSW-Program-Unit SPAM message of

said station.)

Executing said incorporate-and-retain-Specific-WSW-Enabling-message instructions causes the computer, 73, of the station of FIG. 6 to generate a Specific-WSW-Enabling-message, which is the aforementioned local-cable-enabling-message (#7), and to retain said message at particular Specific-WSW-Enabling-Message-to-Transmit memory. All information of said message is preprogrammed at said computer, 73, prior to the executing of said instructions (including the aforementioned enable-WSW instructions and enable-WSW-programming information that are preprogrammed in said incorporate-and-retain-Specific-WSW-Enabling-message instructions), and said incorporate-and-retain-Specific-WSW-Enabling-message instructions cause said computer, 73, to select the specific preprogrammed information of said message from among all the preprogrammed information of said computer, 73, and to assemble said selected information at said memory. When assembled, said message consists of an "01" header; an execution segment of particular preprogrammed enable-next-program-on-CC13 information that is addressed to URS signal processors, 200; a meter-monitor segment whose information is identical to the meter-monitor information of said Select-WSW-Program-Unit SPAM message; appropriate padding bits; an information segment that contains particular enable-CC13 instructions and said enable-WSW instructions which include said enable-WSW-programming information; and an end of file signal.

Executing said timing instructions, causes each intermediate station to commence transmitting its station specific Select-WSW-Program-Unit SPAM message at a station specific time; to transmit said message over and over for a station specific interval of time; to execute said interconnect-and-encrypt-the-audio-of-WSW instructions at a particular time; and to transmit its station specific Specific-WSW-Enabling-message after a particular enabling time The particular time at which any given station commences transmitting its station specific Select-WSW-Program-Unit SPAM message is before the minimum time prior to the commence enabling time of said station necessary for each subscriber station of said intermediate station, functioning in the fashion of example #5, to detect and process at least one instance of said Select-WSW-Program-Unit message and then to tune to the transmission of a selected master cable control channel and receive, in the fashion described below, the station specific Specific-WSW-Enabling-message of its intermediate transmission station. The particular number of times that any given intermediate station transmits its station specific Select-WSW-Program-Unit SPAM message is the number of times necessary to permit apparatus of a signal processor, 200, at each subscriber station of said intermediate station to detect and process at least one instance of said Select-WSW-Program-Unit message.

In due course, executing said timing instructions causes the computer, 73, of the station of FIG. 6 to commence transmitting the SPAM message at its particular Select-Program-Unit-Message-to-Transmit memory, which is its station specific Select-WSW-Program-Unit SPAM message, embedded in the normal transmission location of cable channel 13.

Subsequently, executing said timing instructions causes said computer, 73, to execute said interconnect-and-encrypt-the-audio-of-Wsw instructions.

Executing said last named instructions causes said computer, 73, to cause apparatus of said station to receive the transmission of the program originating studio of the "Wall Street Week" program; to input said transmission, via the matrix switch, 75, of said station, to particular apparatus, well known in the art, that encrypt the audio portion of said transmission and output the video and encrypted audio portions of said transmission in proper synchronization; to cause said apparatus to encrypt the information of said audio portion using a particular preprogrammed cipher algorithm C and cipher key Ca; and to transfer the output of said apparatus, via matrix switch, 75, to field distribution system, 93, via the particular modulator, 82, 86, or 90, of cable channel 13.

In due course, while scanning sequentially all channels in the fashion of example #5, the apparatus of the signal processor, 200, of the station of FIGS. 7 and 7C detects one instance of the Select-WSW-Program-Unit SPAM message of the station of FIG. 6 and inputs said message to the controller, 39, of the decoder, 30, of said signal processor, 200.

Receiving said Select-WSW-Program-Unit message causes the apparatus of said signal processor, 200, to input said message to the microcomputer, 205, of said station. Automatically, said controller, 39, determines that the execution segment of said message matches its preprogrammed available-television-program controlled-function-invoking information; executes the associated controlled function instructions; inputs said message to the buffer/comparator, 8, of said signal processor, 200; and to inputs particular step-completed information to said controller, 20. (Receiving said information causes controller, 20, to cause the relevant apparatus of said signal processor, 200, to commence functioning to identify program unit identification signal information in the fashion described in example #5.) Receiving said message causes buffer/comparator, 8, to input said message to controller, 12. Receiving said message causes controller, 12, to execute particular preprogrammed controlled function instructions; to establish a control information communications link , via matrix switch, 259, to the buffer, 39G, of the controller, 39, of said decoder, 203; to transfer said message, via said link, to said buffer, 39G.

Receiving said Select-WSW-Program-Unit message causes decoder, 203, to execute the information of the information segment of said message as a machine language job. Automatically, control processor, 39J, executes particular preprogrammed available-television-program controlled function instructions that cause said control processor, 39J, to input the information of the information segment of said message to the CPU of microcomputer, 205, and to cause said CPU to execute the information so inputted as a machine language job. The information so inputted is the aforementioned determine-whether-to-select instructions that contain said particular specific-WSW information and said please-fully-enable-WSW-on-CC13-at-particular-8:30 information.

Executing said determine-whether-to-select instructions causes microcomputer, 205, to input said please-fully-enable-WSW-on-CC13-at-particular-8:30 information to the controller, 20, of signal processor, 200. Said instructions contain one instance, and the the aforementioned program-unit-of-interest information that is preprogrammed at said microcomputer, 205, contains a second instance of specific-WSW information, which second instance reflects the wish of the subscriber of

said station to view (or record) said "Wall Street Week" program when said program is transmitted. Automatically, microcomputer, 205, compares said one instance to said program-unit-of-interest information and determines a match with said second instance. Determining a match causes microcomputer, 205, automatically to input said please-fully-enable-WSW-on-CC13-at-particular-8:30 information to the controller, 20.

Receiving said please-fully-enable-WSW-on-CC13-at-particular-8:30 information causes controller, 20, in a predetermined fashion, to prepare particular apparatus of signal processor, 200, to receive said local-cable-enabling-message (#7) (which is the station specific Specific-WSW-Enabling-message of the station of FIG. 6). Controller, 20, is preprogrammed with particular receive-authorizing-info-at-appointed-time instructions, information of a particular standard-local-station-interval quantity of time, particular enable-next-program-on-CC13 information, and information of a particular master cable control channel. Receiving said please-fully-enable-WSW-on-CC13-at-particular-8:30 information causes controller, 20, to execute said receive-authorizing-info-at-appointed-time instructions. Automatically, controller, 20, selects said CC13 and said particular-8:30 information from the information of said please-fully-enable-WSW-on-CC13-at-particular-8:30 information and computes the aforementioned commence-enabling time (see example #7) by subtracting said standard-local-station-interval quantity of time from the schedule time information of said particular-8:30 information. At said commence-enabling time, receiving time information from clock, 18, causes controller, 20, automatically to cause all apparatus of decoder, 30, to delete from memory all information of received SPAM information; to cause the controller, 39J, of said decoder, 30, to place one instance of said enable-next-program-on-CC13 information at a particular controlled-function-invoking information location; to cause apparatus of signal processor, 200, to input the transmission of said cable control channel to decoder, 30; and to cause the EOFS valve, 39F, of said decoder, 30, to commence processing detected SPAM information to detect an end of file signal. In so doing, controller, 20, causes decoder, 30, to commence receiving the transmission of said master cable control channel and processing SPAM information in said transmission. In addition, controller, 20, automatically places one instance of said enable-next-program-on-CC13 information at a particular controlled-function-invoking-@20 information location at controller, 20.

In due course, executing said timing instructions causes the computer, 73, of the station of FIG. 6 to transmit a particular message that ends with an end of file signal.

Receiving said message causes said EOFS valve, 39F, to detect the end of file signal in said message, thereby causing the apparatus of decoder, 30, to commence identifying and processing the individual SPAM messages embedded in said transmission.

Then executing said timing instructions causes said computer, 73, to transmit said local-cable-enabling-message (#7)

(At each other intermediate transmission station that receives and executes the information of said Prepare-To-Retransmit-WSW message, executing said information causes said station to transmit its own station specific Specific-WSW-Enabling-message on its own station

specific master cable control channel, thereby enabling its subscriber stations that receive and execute the information of said message to receive the "Wall Street Week" retransmission of said intermediate transmission station in a fashion that differs from intermediate station to intermediate station. For example, whereas the intermediate station of FIG. 6 encrypts the audio of said transmission using cipher key Ca, another intermediate transmission station can use a different cipher key--for example, Ta--and cause its selected subscriber stations to decrypt said audio properly by means of the information of its own station specific Specific-WSW-Enabling-message.)

Receiving said local-cable-enabling-message (#7) at the station of FIG. 7 causes the apparatus of said station to function in precisely the fashion of example #7. Receiving said message causes the decoder, 30, of signal processor, 200, to detect and transfer said message to the controller, 20. Receiving said message causes said controller, 20, to execute said enable-CC13 instructions; to sample selected SPAM information of the station of FIG. 7 and determine that unauthorized tampering has not occurred; to cause selected apparatus of said station--cable converter box, 201, matrix switch, 258, and a decryptor, 107 (that exists at said station, that receives its input from and transfers its output to matrix switch, 258, and is controlled by controller, 20, but that is not shown in FIG. 7)--to receive the transmission of cable channel 13; to cause said selected decryptor, 107, to decrypt the audio portion of said transmission using selected cipher algorithm and key information; to cause selected apparatus of signal processor, 200, to commence waiting to receive further enabling information; to execute said enable-WSW instructions; and to place instances of said enable-WSW-programming information at particular controlled-function-invoking information memory locations at the controller, 39, of decoder, 30, and at controller, 20. And completing said enable-WSW instructions causes controller, 20, to initiate a meter record at buffer/comparator, 14, that documents the decryption of the cable audio transmission at said station.

(Simultaneously, other subscriber stations [i.e., ultimate receiver stations] of the field distribution system, 93, of the intermediate transmission station of FIG. 6 sample selected SPAM information in their subscriber station specific fashions and determine whether unauthorized tampering has occurred and decrypt the audio portion of said transmission or respond in the fashions described above in example #7 if they determine that unauthorized tampering has occurred. Meanwhile, at the field distribution systems, 93, of other intermediate transmission stations, other subscriber stations each receive the station specific Select-WSW-Program-Unit SPAM messages of their specific intermediate station, tune to an intermediate station specific transmission channel [e.g. cable channel 11 rather than 13] in an intermediate station specific fashion [e.g. by decrypting with cipher key Ta rather than Ca] and even at an intermediate station specific time [e.g. at 9:30 PM rather than 8:30 PM] to receive said "Wall Street Week" program, sample selected subscriber station specific SPAM information in their subscriber station specific fashions, determine whether unauthorized tampering has occurred, and respond station specifically in the fashions described above.)

Subsequently, but still in the interval between said commence-enabling time and said 8:30 PM time, said program originating studio that originates the "Wall Street Week" transmission embeds and transmits the

1st-WSW-program-enabling-message (#7) SPAM message.

Transmitting said message causes said message to be detected at the signal processor, 200, of the station of FIG. 7 and inputted to the controller, 20, and causes controller, 20, to load and execute the 1st-stage-enable-WSW-program instructions in said message.

Executing said 1st-stage-enable-WSW-program instructions causes controller, 20, in the predetermined fashion of said instructions (which fashion that is not described in example #7 above), to cause microcomputer, 205, to authorize reception of said "Wall Street Week" program so-called "pay-per-view" basis. Automatically, under control of said instructions, controller, 20, inputs to microcomputer, 205, a particular check-station-specific-selection-and-display instruction and particular reception-of-WSW-costs-20-cents information (which instruction and information is preprogrammed in said 1st-stage-enable-WSW-program instructions). Receiving said instruction and said information causes microcomputer, 205, to execute particular preprogrammed instructions and, in a predetermined fashion, to determine that the aforementioned station-specific-television-program-selection-and-display instructions at said microcomputer, 205, include particular information that the subscriber of said station is willing pay up to a certain limit--twenty-five cents--to receive said program. So determining, under control of said instructions, causes microcomputer, 205, to input a particular preprogrammed pay-per-view-authorizing instruction to said controller, 20.

Receiving said instruction causes controller, 20, under control of said 1st-stage-enable-WSW-program instructions, to perform a first stage of decrypting the video information of the "Wall Street Week" program transmission in precisely the fashion described in example #7.

(Executing the information of said 1st-WSW-program-enabling-message (#7) message causes the microcomputers, 205, of selected other stations that receive said message also to authorize so-called "pay-per-view" reception of said "Wall Street Week" program. At said stations that authorize reception, apparatus receive and process subsequent information of the "Wall Street Week" transmission just as at the station of FIG. 7. However, at certain other stations that receive and process said message the preprogrammed station-specific-television-program-selection-and-display instructions at the microcomputers, 205, do not include information that the subscribers of said last named stations are willing pay to receive said program. Executing the information of said message at said last named stations causes the microcomputers, 205, of said stations to identify and execute particular station-specific-alternate-handling ones of said station-specific-television-program-selection-and-display instructions. Executing said ones causes each preprogrammed fashion to handle subsequent information of said transmission. Under control of their particular station-specific-alternate-handling instructions, selected ones of said certain other stations discard all subsequent information of said transmission by causing their station apparatus to cease receiving and decrypting the information of said transmission. Under control of their particular station-specific-alternate-handling instructions, selected others of said certain other stations cause apparatus of their specific stations to record the information of said transmission--albeit, the encrypted information--thereby enabling a subscriber at each of said specific stations individually and manually to

so-called "play back" the recorded encrypted information of said transmission and input a pay-per-view-authorizing instruction to a controller, 20, at his specific station, thereby causing said controller, 20, and other apparatus of the station of said subscriber [under control of said controller, 20] at a delayed time to decrypt, process, and display the information of said transmission in the fashion of the apparatus of the station of FIG. 7 [because in the preferred embodiment, the information of said 1st-WSW-program-enabling-message (#7) SPAM message embedded and transmitted more than once in said transmission in a fashion that enables a video recorder/player, 217, to record at least one full instance of an end of file signal followed by said information at every one of said certain other stations]. Executing said station-specific-alternate-handling instructions at said certain other stations causes a controller, 20, at each of said stations to switch power on to a video recorder/player, 217, at each of said stations; to cause a matrix switch, 258, at each of said station to commence transferring the output of the decryptor, 107, of said station to said recorder/player, 217; and to cause said recorder/player, 217, to commence recording the inputted transmission.)

Subsequently, but still before said 8:30 PM time, the program originating studio that originates the "Wall Street Week" transmission embeds and transmits the 1st-WSW-decryption-check (#7), the eight SPAM messages each of which is called a "2nd-WSW-program-enabling-message (#7)", and the 2nd-WSW-decryption-check (#7) just as in example #7.

Up to a particular point, receiving each of said messages causes the apparatus of the station of FIG. 7 (and all other subscriber stations that receive said messages--whether so-called "live" or so-called "time delayed") to function just as receiving said messages causes the apparatus of the station of FIG. 4 in example #7 to function. Said point occurs after controller, 20, executes the aforementioned additional 2nd-stage-enable-WSW-program instructions which, at the station of FIG. 4, cause the apparatus of said station to commence transferring the decrypted television information of the "Wall Street Week" program to microcomputer, 205, and monitor, 202M.

Executing said additional 2nd-stage-enable-WSW-program instructions at the station of FIG. 7 causes controller, 20, first to cause the apparatus of said station to commence transferring the decrypted television information of the "Wall Street Week" program transmission to decoder, 203, and microcomputer, 205. Automatically, controller, 20, causes matrix switch, 258, to cease inputting the decrypted video information of said transmission to signal processor, 200, (at switch, 1), and to commence transferring said video information (which is inputted to matrix switch, 258, from said decryptor, 231) to divider, 4, thereby causing divider, 4, to transfer said decrypted video information to microcomputer, 205, and to decoder, 203. Automatically, controller, 20, causes decoder, 203, to discard any previously received SPAM information and to commence detecting and processing SPAM information in the inputted decrypted video information in the fashion described above. In so doing, controller, 20, causes decoder, 203, to detect and process any embedded SPAM information of the transmission of the program originating station that originates said "Wall Street Week" program and combines the microcomputer, 205, of the station of FIG. 7 to the computer system of the program originating station that originates said "Wall Street Week" program.

(Simultaneously, the SPAM message information embedded and transmitted at said originating station cause microcomputers, 205, at other stations to be combined to said computer system in the same fashion.)

Thereafter, said additional 2nd-stage-enable-WSW-program instructions affect the apparatus of the station of FIG. 7 differently from the station of FIG. 4. At the station of FIG. 4 where the television programming output transmission of the PC MicroKey System of microcomputer, 205, is inputted directly to TV monitor, 202M. By contrast, at the station of FIG. 7, the television programming output transmission of microcomputer, 205, is inputted to matrix switch, 258. Furthermore, the station of FIG. 7 is preprogrammed with the aforementioned station-specific-television-program-selection-and-display instructions.

At the station of FIG. 7, executing said additional 2nd-stage-enable-WSW-program instructions causes controller, 20, thereafter to cause the apparatus of said station to determine that monitor, 202M, is not on and operating. Automatically, controller, 20, causes control processor, 20A, in the fashion described above, to establish a control information communications link, via matrix switch, with a SPAM TV signal decoder, 145, at monitor, 202M, that controls monitor, 202M. Automatically, controller, 20, transmits particular information to said decoder, 145, that causes said decoder, 145, to determine, in a predetermined fashion, that power is not on to monitor, 202M, and to respond by transmitting particular 202M-is-not-on information to controller, 20, via said link.

The fact that monitor, 202M, is not on signifies that the subscriber of the station of FIG. 7 is not viewing television information at monitor, 202M, and suggests that said subscriber may not even be present at said station.

Receiving said 202M-is-not-on information causes controller, 20, under control of said additional 2nd-stage-enable-WSW-program instructions, to cause microcomputer, 205, to input particular preprogrammed instructions to said controller, 20, which instructions reflect the the specific fashion in which said subscribe wants any given selected program to be selected and displayed. Automatically, controller, 20, inputs a particular choose-mode-of-selection-and-display instruction and said 202M-is-not-on information to microcomputer, 205, and receiving said instruction and said information causes microcomputer, 205, in a predetermined fashion, to process the aforementioned station-specific-television-program-selection-and-display instructions. Automatically, under control of said instructions, microcomputer, 205, inputs to controller, 20, particular preprogrammed display-at-202M-and-record-at-217 instructions.

Receiving said display-at-202M-and-record-at-217 instructions causes controller, 20, to switch power on to monitor, 202M, and commence transferring the television output transmission of microcomputer, 205, to said monitor, 202M; to switch power on to video recorder/player, 217, (which has capacity to receive and record the information of an audio and a composite video transmission); to commence transferring the television output transmission of microcomputer, 205, to said recorder/player, 217; and to cause said recorder/player, 217, to record said transmission. Automatically, controller, 20, inputs a particular instruction to decoder, 145, via said communications link, that causes decoder, 145, to

switch power on to monitor, 202M, and to tune monitor, 202M, in a predetermined fashion. Automatically, controller, 20, causes matrix switch, 258, to transfer the decrypted audio information inputted from decryptor, 107, to monitor, 202M, and also to recorder/player, 217. Automatically, controller, 20, causes matrix switch, 258, to transfer the video information inputted from microcomputer, 205, to monitor, 202M, and also to recorder/player, 217. Automatically, controller, 20, causes control processor, 20A, to establish a control information communications link, via matrix switch, 259, with a SPAM TV signal decoder, 218, at recorder/player, 217, that controls recorder/player, 217, and transmits particular information to said decoder, 218, that causes said decoder, 218, to switch power on to recorder/player, 217, and to cause recorder/player, 217, to record the inputted audio and video information (including any SPAM message information embedded in said audio and video information). In so doing, controller, 20, causes monitor, 202M, to receive the decrypted video and audio information of the "Wall Street Week" program, to display the video image of said information, and to emit sound in accordance with said audio information and causes recorder/player, 217, to record said information of the "Wall Street Week" program.

(Simultaneously, the SPAM message information embedded and transmitted at said program originating station and the station-specific-television-program-selection-and-display instructions of other stations cause the apparatus of said stations to handle the programming transmitted by said originating station in station specific fashions. Some stations, where monitors, 202M, are determined to be off, may respond by causing receiver apparatus to cease receiving the transmission of said programming, thereby discarding all information of said "Wall Street Week" program. At other stations that lack microcomputers, 205, the controllers, 20, operating under control of said said additional 2nd-stage-enable-WSW-program instructions, cause the apparatus of said stations to transfer the decrypted video information outputted by decryptors, 231, directly to monitors, 202M, thereby causing said monitors, 202M, to display the conventional television information of said program [e.g. FIG. 1B] without any combined, locally generated information [e.g. FIG. 1A].)

In due course, at said 8:30 PM time, said program originating studio commences transmitting the programming information of said "Wall Street Week" program, thereby causing the apparatus of the station of FIG. 7 (and of other correctly regulated and connected stations) to commence functioning in the fashions described above in "One Combined Medium" and in examples #1, #2, #3, and #4.

And in the fashions described above, receiving each SPAM message that causes decrypting causes the station of FIG. 7 (and causes other stations) to retain and process meter information. And receiving at any SPAM decoder of said station any SPAM message that contains meter-monitor information causes the apparatus of said station (and causes apparatus at other stations that are preprogrammed to collect monitor information) to retain and process monitor information.

Controlling Computer-Based Combined Media Operations

So far in this specification has treated the process of controlling combined medium operations as if the process of generating the computer information of any given computer based combining--for example, the FIG.

1A information of the FIG. 1C combining--begins with the embedding, at a program originating studio, and transmitting of instructions that cause subscriber station microcomputers, 205, to generate said computer information. (In the case of said FIG. 1A information, this specification has, so far, treated the process of generating the particular information of said FIG. 1A as if said process begins with the embedding and transmitting of the first message of the "Wall Street Week" example.)

In actuality, the process of controlling computer-based combined media operations is continuous and involves systematic inputting and maintaining of up-to-date user specific data at each subscriber station. (For example, only at subscriber stations where user specific stock data is maintained systematically and up-to-date can the program instruction set of the first message of the "Wall Street Week" example generate FIG. 1A images that actually show the performance of the portfolios of the subscribers of said stations.)

Of course, individual subscribers can, themselves, maintain their data systematically and up-to-date. And at stations where subscribers so do, control computer-based of combined medium operations can, indeed, begin with the embedding, at a program originating studio, and transmitting of instructions that cause subscriber station microcomputers, 205, to generate the computer information of a given computer based combining.

However, the present invention provides means and methods for systematically inputting and maintaining user specific data at subscriber stations.

Microcomputer, 205, has an installed modem; receives information that is transmitted by means of telephone or data communications network, 262; is preprogrammed to answer telephone calls automatically, in a fashion well known in the art; and is preprogrammed to process data received via said network, 262. Each time the stockbroker who represents the subscriber of the station of microcomputer, 205, executes a transaction (that is, buys or sells stocks) for said subscriber's account, a computer at said broker's office station telephones microcomputer, 205; inputs data of the transaction (which data includes, for example, the identity of the company whose shares were traded, the number of shares bought or sold, and whether the transaction was a buy or a sale); and causes microcomputer, 205, to updates its stock portfolio records in a predetermined fashion (for example, by adding to said records data of shares bought and removing data of shares sold). In so doing, said office station computer causes causes an up-to-date record of the identity of the stocks and number of shares in the subscriber portfolio automatically to exist at microcomputer, 205. (While a time lag may exist between the actual purchase or sale and the updating at microcomputer, 205, said updating always occurs before 4:30 PM on the day of sale or purchase.)

Each weekday after 4:30 PM, a remote stock-price-data-transmission station transmits all closing stock price data applicable that day and causes apparatus at each subscriber station, in a predetermined fashion, to select and record at the microcomputer, 205, of said station the particular closing price datum or data that apply to the particular stock or stocks of the preprogrammed portfolio of said computer. (Said remote station transmits said closing stock price data and causes specific subscriber stations to select and process their specific information of interest in the fashion in which remote news-service-A station

transmitted the AT&T news item and caused selected stations to select and process, in their specific fashions, the information of said item.) Alternatively, microcomputer, 205, is caused in a predetermined fashion (for example, by a SPAM message a given transmission monitored by signal processor, 200, in any of the above described fashions) automatically to telephone a remote data service computer, by means of network, 262, in a fashion well known in the art, and to cause said remote computer to select and transmit the particular closing price datum or data of the stock or stocks of the portfolio of said microcomputer, 205, thereby causing said microcomputer, 205, to record said datum or data in a predetermined fashion.

In this fashion, by a particular time (for example, 8:00 PM) on a particular Friday evening, the microcomputer, 205, of the station of FIG. 7 (and microcomputers, 205, similarly at each of a large plurality of other subscriber stations) has been updated and contains all relevant stock information.

Subsequently, but before the aforementioned 8:30 PM time (which is 8:30 PM, Eastern Standard Time on said Friday evening and is the time when so-called "live" transmission of the "Wall Street Week" program commences), the program originating studio that originates transmission of the "Wall Street Week" program transmits the aforementioned Prepare-To-Retransmit-WSW message, 1st-WSW-program-enabling-message (#7), 1st-WSW-decryption-check (#7), eight SPAM messages each of which is called a "2nd-WSW-program-enabling-message (#7)", and 2nd-WSW-decryption-check (#7). In so doing, said studio causes a plurality of intermediate transmission stations that are preprogrammed and function in the fashion of the station of FIG. 6 and a plurality of subscriber stations that are preprogrammed and function in the fashion of the station of FIG. 7 (and 7C) to cause apparatus at each of said subscriber stations to interconnect, receive information of said transmission, decrypt said information, and prepare to display (or otherwise output) information of said "Wall Street Week" program in the fashions of example #7 and of the above description called "MORE ON EXAMPLE #7".

(To accomplish all this has required only that the subscriber of microcomputer, 205, [and other subscribers at other stations] cause the installation and connection of the apparatus shown in the figures of this submission, especially FIG. 7 (and 7C); caused his microcomputer, 205, to be preprogrammed as described above; and preinformed microcomputer, 205, of his wish to view said "Wall Street Week" program by causing the aforementioned select-WSW information to be recorded at said microcomputer, 205.)

Then the combined medium combining process described above in "One Combined Medium" and in examples #1, #2, #3, #4, etc. commences. And the FIG. 1C combining is displayed.

But the combining of FIG. 1C is just part of a larger process.

When the "Wall Street Week" transmission begins at 8:30 PM on a Friday evening, the program instruction set in the first message of the "Wall Street Week" example instructs microcomputer, 205, to generate not one but a plurality overlays. The combining of FIG. 1C is merely the first.

Computer operations take time and some computers are slower than others. Partly this is a question of hardware; a so-called eight bit microprocessor is generally slower performing a given operation than a sixteen bit processor for reasons that are well known in the art. But even with precisely the same hardware and systems software, two computers can take different times to complete a given operation if only because they contain different data. For example, it takes longer to calculate the value of a portfolio containing one thousand stocks than a portfolio of one. Furthermore, it is undesirable to separate computer operations merely because they result in the generation of separate overlays because such separation may result in unnecessary duplication of calculations. For example, the FIG. 1C display of user specific overall stock portfolio performance could be followed by second and third displays that analyze portions of the subscriber's portfolio--e.g., the portion invested in New York Stock Exchange listed stocks in comparison to the so-called "NYSE" index and the portion invested in so-called "over-the-counter" stocks in comparison to the so-called "NASDAQ" index. In order to calculate the value of the overall portfolio, it is necessary to calculate the value of these portions. To require that the values of the portions be recalculated for subsequent overlays would be inefficient.

In computer-based combined medium communications, the amount of information that a given system can convey is dependent on the efficiency of the employment of program instruction sets and combining synch commands.

In the preferred embodiment, unlike conventional television where information is presented strictly in the sequence of its transmission, the transmission and execution of program instruction set information for second (or subsequent) overlays can precede the transmission of the combining synch command of first overlays and the time of first overlay ceasings. To minimize waiting time, the controllers, 39, of decoders, 203, (or analogous controllers, 44 or 47, of analogous radio decoders of FIG. 2C of other decoders of FIG. 2D that execute SPAM message information at a microcomputer, 205) combining synch commands that cause combining or the ceasing of combining (as, for example, the commands of the second and third messages of the "Wall Street Week" example) are processed as interrupts to the CPUs of microcomputers, 205; program instruction sets, once executed, instruct microcomputers, 205, to wait only when further processing, under the control of the instructions of said sets, would entail overwriting RAM information whose overlay time or processing time has not yet ended. And to prevent microcomputers, 205, that fall behind from displaying incomplete overlays, any given SPAM message that causes a combining specifies the identity of the particular overlay information whose combining it causes and causes a combining only at subscriber station where information exists of the completion of the identified overlay. For example, receiving the second message of the "Wall Street Week" program causes the combining of FIG. 1A information and FIG. 1B information only at stations where information at the aforementioned SPAM-first-precondition and SPAM-second-precondition register memories matches selected information of the meter-monitor segment of said message.

Finally, in order to cause microcomputers, 205, that fall behind to catch up, a particular fashion exists in the preferred embodiment for restoring efficient operations. Microcomputers, 205, that fall behind are caused to jump over and avoid executing instructions that control the

generating of overlay information (such as FIG. 1A) whose overlay time (that is, combining time) has passed. In a fashion well known in the art, selected so-called "lines of code" of program instruction sets are preprogrammed with label information that identifies each one of said line, and the instructions of said set periodically compare preprogrammed information of said set to information at particular overlay-target RAM memory in order to control efficient operation in a fashion described more fully below. When a combining fails to occur at any given station because information of the completion of an identified overlay does not exist at said station, the controller, 203, of said station automatically causes the microcomputer, 205, to so-called "jump", in a jump fashion well known in the art, to that selected one of said lines of code where the instructions of said program instruction set commence causing the generation of the information of that particular overlay that is next to be combined. For example, at the start of the "Wall Street Week" example, information of "00000000" exists at the SPAM-second-precondition register memories of the decoders, 203, of every subscriber station. The overlay of FIG. 1A is the first overlay of the "Wall Street Week" program, and the information of the meter-monitor field of the second message of said example identifies said overlay with binary information of "00000001". The next overlay of said program, which is the second overlay, is identified with information of "00000010". Receiving said second message causes the decoders, 203, at each subscriber station to compare information at said SPAM-second-precondition register memories to the "00000001" information of the overlay number field of said message. At those stations that have completed generating at RAM the information of said first overlay (e.g., FIG. 1A), the instructions of the program instruction set of said example have caused information of "00000001" to be placed at said SPAM-second-precondition memories. At said stations, matches result and cause the combining of locally generated overlay information (e.g., FIG. 1A) with the transmitted FIG. 1B information and cause the display of combined medium information (e.g., FIG. 1C). At other stations that have not completed generating at RAM the information of said first overlay (e.g., FIG. 1A), matches do not result, causing the controllers, 39, of the decoders, 203, of said stations to execute the aforementioned particular second-condition-test-failed instructions of the aforementioned conditional-overlay-at-205 instructions. Executing said second-condition-test-failed instructions causes each of said controllers, 39, to compute a particular overlay-target number; to interrupt the operation of the CPU of the microcomputer, 205, of its station; to cause said CPU to place information of said overlay-target number at particular overlay-target RAM memory; to cause said CPU to execute a so-called "machine language jump" to the particular so-called "offset address" of the information at RAM of said program instruction set that is associated, in the predetermined fashion of the instructions of said set, with said overlay-target number; and to cause said microcomputer, 205, to continue executing the instructions of said set from the instruction at said address. In so doing, said microcomputer, 205, can skip over and avoid executing instructions whose overlay time has passed.

The particular overlay-target number that any given controller, 39, calculates, under control of said second-condition-test-failed instructions, is a function of the overlay number information of the SPAM message that invokes said conditional-overlay-at-205 instructions and is also a function of the history of the efficiency of the operation of the microcomputer, 205, of the subscriber station of said controller, 39, at

the time when said instructions are invoked. In the case the second message of the "Wall Street Week" example, the overlay that said message causes to be combined is the first overlay generated under control of the program instruction set that generates said overlay. Accordingly, the information recorded, in a predetermined fashion, at particular history-of-efficiency memory at each controller, 39, of a decoder, 203, of said other stations (that have not completed generating the information of said first overlay at the time of receiving said second message) is "00000000" and indicates that said microcomputer, 205, has not failed to generate any overlay, generated under control of said set, on time. Thus when receiving said second message at said other stations causes the execution of said second-condition-test-failed instructions, said instructions cause said controllers, 39, to increment by one the overlay number information of said message, thereby generating overlay-target information of "00000010"; to cause the microcomputers, 205, of said stations to place information of said "00000010" at said overlay-target RAM memory; to cause said microcomputers, 205, to jump to and continue executing the instructions of said program instruction set at the instruction at the particular preprogrammed "offset address" of the particular line of code of said set that is identified by the particular label associated, in a predetermined fashion, with said "00000010"; and to increment by one the information at said history-of-efficiency memory, thereby generating history-of-efficiency information of "00000001" which indicates that said microcomputer, 205, has failed to generate one overlay, generated under control of said set, on time. Thereafter, whenever receiving a SPAM message of said "Wall Street Week" program causes a controller, 39, of said other stations to execute said second-condition-test-failed instructions, said instructions cause said controller, 39, to compute its overlay-target number by incrementing the overlay number information of said message by more than one and to cause the microcomputer, 205, of its station to restore efficiency by skipping over instructions that cause the generation of more than one overlay (including one or more overlays whose overlay time has not yet come). As said microcomputer, 205, generates the information of the overlay that is identified by said overlay-target number, the instructions of said set cause said microcomputer, 205, in a predetermined fashion that involves comparing preprogrammed particular overlay-being-generated information of said set to information at said overlay-target RAM memory, to identify particular instructions of said set that control just the generation of said one or more overlays whose overlay time has not yet come and to jump over and avoid executing said instructions, thereby executing only those instructions that control generation of information of said identified overlay (or of overlays whose overlay time follows the overlay time of said identified overlay). In so doing, said microcomputer, 205, can skip over and avoid executing selected instructions whose overlay time has not passed in order to catch up and recommence combining at an overlay time that is after the overlay time of the overlay or overlays whose generation is controlled by said selected instructions.

Thus transmitting to a plurality of subscriber stations any given SPAM message that invokes said conditional-overlay-at-205 instructions causes apparatus at selected ones of said stations to combine locally generated overlay information (e.g., FIG. 1A) with transmitted information (e.g., FIG. 1B) and to cause the display of combined medium information (e.g., FIG. 1C) and causes apparatus at selected other stations to generate information of overlays whose combining is not caused by receiving said

message (because the overlay times of said overlays is subsequent to the overlay time of said locally generated overlay information [e.g., FIG. 1A] whose combining is caused by said message). Furthermore, transmitting said messages causes the apparatus at said selected other stations to generate information of overlays in such a way that each station generates information of an overlay that has a specific overlay time and the specific overlay time of the overlays generated at specific station varies from station to station and is different at different stations.

Transmitting and Receiving Program Instruction Sets

In television, the normal transmission location is in the vertical interval of the television transmission. SPAM signals are not normally transmitted in the visible portion of the television picture because the information of said signals can be seen by viewers (often as so-called "snow"). However, the transmission capacity of the vertical interval is limited.

In computer-based combined medium communications, the amount of locally generated information that any given system can display (or otherwise output) to subscribers is dependent on maximizing the volume of program instruction set instructions that said system can transmit and maximizing the time interval between the transmission (more precisely, the execution) of the instructions of any given program instruction set and the overlay times of the individual locally generated overlays whose generation said instructions cause. The greater the volume of program instruction set information that is transmitted in any given combined medium program, the greater is the amount of overlay information can be generated at subscriber stations. And the earlier said information is transmitted in said program, the greater is the efficiency with which generating is controlled at subscriber stations (because the longest possible time intervals can separate the commencement of the generating of the information of individual overlays and the individual overlay times of said overlays).

In the preferred embodiment, the program instruction set information of any given combined medium program is transmitted as soon as possible after commencement of said program, and the present invention includes means and methods to maximize the transmission of program instruction set information at the start of combined medium programs. (As related above, in the preferred embodiment, all SPAM commands are transmitted in the normal transmission location of any given transmission.)

In the video/computer combined medium, capacity is found by transmitting said sets in portions of the television picture that are covered by locally generated overlays (which in digital television transmissions can include frames of transmitted video that are "frozen" after reception in fashions well known in the art). One controlled function that is preprogrammed at the controllers, 39, of the decoders, 203, of subscriber stations and that is caused to be executed by receiving a SPAM message containing expand-to-full-field-search execution segment information is a function whose instructions cause said controller, 39, to cause the line receivers, 33, of said decoders, 203, to commence detecting digital information in every frame of its received video information from the first detectable portion of line 20 of said frame to the last detectable portion of the last line of said frame. A second controlled function that is preprogrammed at said controllers, 39, and that is caused to be

executed by receiving a SPAM message containing resume-normal-location-search execution segment information is a function whose instructions cause said controller, 39, to cause said line receivers, 33, to commence detecting digital information in the normal transmission location of every frame of its received video information.

An example illustrates transmitting program instruction set information in a portion of the television picture that is normally visible but that is temporarily covered by an overlay. In the example, the program originating studio that originates a given program causes each subscriber station to generate information of the so-called "titles" of said program (that is, the textual information listing the title said program, the names of the cast and crew members, etc.), causes said locally generated information to overlay and obscure completely the transmitted video information of said program, and transmits program instruction set information in the full field video of the transmission so obscured (that is, in every frame of the transmitted video information from the first detectable portion of line 20 of said frame to the last detectable portion of the last line of said frame).

The decoder, 203, of the station of FIG. 7 and 7C (and the decoder, 203, of every other subscriber station tuned to said program) is preprogrammed to respond to SPAM messages containing expand-to-full-field-search execution segment information and resume-normal-location-search information and responsively to alter automatically the portions of its received video information that are searched for embedded digital information.

At the start of the conventional television information of said program, said program originating studio embeds a SPAM message that contains the execution segment information that is identical to the execution segment information of the first message of the "Wall Street Week" example and information segment information of a particular set-to-color program instruction set. Receiving said message causes apparatus at each station, in the fashions described above, to execute the information of said set; to clear the video RAM of the microcomputer, 205, of said station; and to set all of said RAM, in a fashion well known in the art, to an opaque background color such as light blue.

Next said program originating studio embeds a SPAM message that contains the execution segment information that is identical to the execution segment information of the second message of the "Wall Street Week" example. Receiving said message causes said apparatus to combine the overlay information of said video RAM and the transmitted video and to continue executing the instructions of said first set. In so doing, said apparatus causes said transmitted video to be covered and obscured completely by said opaque background color.

Then said studio embeds a SPAM message that contains one instance of said expand-to-full-field-search execution segment information. Receiving said message causes apparatus at each station to cause the line receiver, 33, of the decoder, 203, of said station to commence detecting digital information in every frame of its received video information from the first detectable portion of line 20 of said frame to the last detectable portion of the last line of said frame.

Then said studio embeds in the full field video and transmits a SPAM

message that contains said execute-at-205 execution segment information and information segment information of a particular titles-of-this-program program instruction set. Receiving said message causes apparatus at each station to execute the information of said set at the microcomputer, 205, of said station. So executing said information causes said microcomputer, 205, to commence generating at said RAM, in a fashion well known in the art, the image information of a so-called "crawl" of said titles. In so doing, said studio causes said microcomputer, 205, to display the information of said titles at the monitor, 202M, of said station. (Simultaneously, a microcomputer, 205, at every other subscriber station executes the same information and displays the same titles, and said studio transmits audio information of appropriate so-called "program theme music," causing apparatus at each station to emit the sound of said music.)

Then said studio embeds in the full field video and transmits a particular program-instruction-set-of-this-program SPAM message that contains particular record-at-256 execution segment information and information segment information of a particular generate-overlays-of-this-program program instruction set.

Receiving said message causes apparatus at each station to transfer the information of said message to the computer memory unit, 256, of said station (which is shown in FIG. 7 and is, for the purposes of this example, a floppy disk drive of microcomputer, 205, that is labelled drive "C:" by said microcomputer, 205, and that is capable of receiving and recording information independently of said microcomputer, 205), and receiving said message causes said unit, 256, to record said program instruction set. Automatically, the controller, 39, of said decoder, 203, causes the control processor, 20A, of said station to establish a control information communication link, via matrix switch, 259, with the controller, 20, of the signal processor, 200; transmits particular instructions to said controller, 20, that cause said controller, 20, to establish a programming information communication link, via matrix switch, 258, with said computer memory unit, 256; and transmits said message, via said matrix switch, 258, to a SPAM decoder, 256A, at said unit, 256. Automatically, said decoder, 256A, receives said message; invokes particular preprogrammed controlled function instructions; causes said unit, 256, to record inputted information in a particular file, "OVERLAYS.EXE"; and inputs the information of said program instruction set to said unit, 256, in the fashion that decoder, 203, inputs the information of the information segment of the first message of the "Wall Street Week" example to microcomputer, 205, thereby causing said unit, 256, to record the information of said set in said file. (Simultaneously, other computer memory units, 256, that are labelled drive "C:" of the microcomputers, 205, of other stations record the information of said set as "OVERLAYS.EXE".)

Then said studio embeds a SPAM message that contains one instance of said resume-normal-location-search execution segment information. Receiving said message causes apparatus at each station to cause the line receiver, 33, of the decoder, 203, of said station to commence detecting digital information in just the normal transmission location of every frame of its received video information.

Then said studio commences transmitting conventional television video image information and embeds and transmits a SPAM message that that is

identical to the third message of the "Wall Street Week" example. Receiving said message causes apparatus of said station (and similar apparatus at every other station) to cease combining the overlay information of said video RAM and the transmitted video and to cause the display of only the transmitted video information at said monitor, 202M. In so doing, said studio causes each station to cease displaying the locally generated information of said "titles" and to commence displaying the information of said conventional television video image.

Then said studio embeds a SPAM message that contains execution segment information that is identical to the execution segment information of the first message of the "Wall Street Week" example and information segment information of a particular "C:OVERLAYS". Receiving said message causes apparatus at each station to input the information of said "C:OVERLAYS" to the microcomputer, 205, of said station and execute said information. Executing said information causes said microcomputer, 205, to load from its C: drive (which is said unit, 256) the information of said OVERLAYS.EXE file and execute the information so loaded as a machine language job.

In this fashion, a program originating studio can transmit information of a program instruction set to a multiplicity of subscriber stations in the full field video of its video transmission and execute the information so transmitted at the microcomputer, 205, of each of said stations as a machine language job without having a viewer of any station view any information of said set at a monitor, 202M.

(To minimize the risk that program instruction sets may become separated from their associated television programming, said sets are normally embedded in their associated television transmissions. But it is not an absolute requirement of the preferred embodiment that all program instruction sets be so embedded. If the volume of program instruction set information that a given programming transmission must transmit exceeds the transmission capacity of said transmission [e.g., if the audience includes viewers who do not have overlay capacity and would see "snow" were set information transmitted in portions of the transmission obscured by overlays], at the proper time transmission stations can transmit said set information outside the conventional transmission [a program originating studio may transmit said set information, for example, in a satellite side lobe of the transponder transmission transmitting the conventional transmission, and a cable head end intermediate transmission station transmits it in a separate television channel or in a transmission in a multiplexed FM frequency spectrum transmission].)

Audio Overlays and Other Overlays

In the present invention, many combinings are caused and controlled besides combinings of video overlay information (such as FIG. 1A) and transmitted television image information (such as FIG. 1B). SPAM messages cause user specific audio to be combined with transmitted radio or television audio information and emitted as sound at subscriber stations. SPAM messages insert user specific print into broadcast print. And SPAM messages insert user specific data into data communications.

FIG. 7D illustrates a radio/computer combined medium. Radio tuner, 209T, receives a conventional radio broadcast transmission. Divider, 209D, splits the received transmission into two paths and transmits one to

microcomputer, 205, and the other to radio decoder, 211, (where the received transmission is inputted to the radio decoder, 42, component). Decoder, 211, detects embedded digital SPAM information; corrects and converts said information; processes said information at the control processor, 44J, of its controller, 44; and inputs selected SPAM information to microcomputer, 205. Microcomputer, 205, has installed capacity to receive an inputted audio transmission; capacity to receive control information and SPAM program instruction set information from said controller, 44; to generate and enter information into audio RAM; to combine audio overlay programming, by means of audio synthesizing techniques and overlay techniques well known in the art, into the received audio transmission; and to transmit the combined audio to speaker system, 263, which has capacity, well known in the art, to convert the received audio into sound.

An example illustrates the operation of the subscriber station of FIGS. 7 and 7D.

A radio station transmits radio programming at 9:00 PM, immediately following the time at which said "Wall Street Week" program ends. At each subscriber station, the stock portfolio and closing price data are recorded precisely as at the start of said "Wall Street Week" program. In the normal transmission location of the radio transmission of said programming, said station embeds and transmits particular SPAM information.

At the station of FIGS. 7 and 7D, the transmission of said station is received at tuner, 209T, and inputted to divider, 209D, which inputs the received radio transmission separately to decoder, 211, and to microcomputer, 205. Receiving said transmission causes decoder, 211, to detect the SPAM information embedded in said transmission and to input information of said SPAM information to microcomputer, 205, which is preprogrammed to process said inputted information. And receiving said transmission causes microcomputer, 205, to input said transmission to speaker system, 263, which is caused thereby to emit sound.

In due course, said radio station embeds a SPAM message that is analogous to the first message of the "Wall Street Week" example. Receiving information of said message causes microcomputer, 205, to record at RAM the digital audio images of three statements made and prerecorded by an announcer--"And the value of your portfolio went up more than the market", "And your portfolio went up but no faster than the market", and "But the value of your portfolio went down"--to compute a first value of the subscriber's portfolio as of the close of business of the day before said transmission; to compute a second value of the subscriber's portfolio as of the close of business of the day of said transmission; to determine that said first value is greater than said second value; to clear audio RAM in a clearing fashion well known in the art; to select information of the audio image, "But the value of your portfolio went down", in a predetermined fashion; and to transfer said selected information to audio RAM. (Receiving said message causes apparatus of other station to function in their own user specific fashions.)

Simultaneously, the audible audio portion of said radio transmission has conveys information of the announcer's voice describing the activity of the stock market and saying, "Stock prices rose today in heavy trading."

Then said radio station transmits an interval of silent audio and embeds, at the beginning of said interval, a SPAM command that causes microcomputer, 205, to generate the synthesized audio of one instance of the image at said audio RAM, to overlay said audio into the transmitted audio, and to transmit the combined audio to speaker system, 263. In so doing, said station causes system, 263, to emit the sound of the announcer's voice saying, "But the value of your stock portfolio went down." (Simultaneously, receiving said message causes apparatus every other station receiving said radio transmission its one selected one of said three statements.)

After an interval of transmitting silent audio that is longer than the longest time required to cause any given subscriber station speaker system, 263, to emit the sound of one of said selected audio images completely, said radio station transmits the audio of said announcer's voice saying, "Now let us turn to the bond markets."

(A broadcast print and computer combined medium subscriber station operates in a similar fashion and is configured similarly to the apparatus of FIG. 7D [except that said station has no divider apparatus analogous to divider, 209D]. Said station has receiver apparatus analogous to radio, 209T; appropriate decoder apparatus that may consist of the digital detector, 46, and controller, 47, of the other decoder of FIG. 2C; a microcomputer, 205; and a printer, 221, instead of speaker system, 263. Said receiver apparatus receives the broadcast print transmission of a broadcast print transmission station and inputs said transmission to said decoder apparatus. Said decoder detects digital information in the inputted transmission; processes SPAM information in the detected digital information; and inputs selected digital information to the CPU of said microcomputer, 205, or transfers other selected digital information to a buffer at microcomputer, 205, that is an input buffer to said printer, 221. In operation, the apparatus of said station receives, 'transfers to printer, 221, and prints the digital information of a SPAM message information segment [which information conveys stock market information and ends with information that is printed as, "Stock prices rose today in heavy trading,"]. Then the decoder of said station detects a SPAM end of file signal and a subsequent SPAM message. Receiving said subsequent message causes said decoder to input information of said message to said CPU. Receiving said information at said CPU causes microcomputer, 205, to receive digital information of three alternate print messages; to compute a first value of the portfolio of the subscriber of said station as of the close of business of the day before said transmission; to compute a second value of the subscriber's portfolio as of the close of business of the day of said transmission; to determine that said first value is greater than said second value; and to transfer to said printer, 221, selected digital information of the print message, "but the value of your portfolio went down." In so doing, said microcomputer, 205, causes said printer, 221, to print the information of said selected print message. Then the decoder of said station detects a SPAM end of file signal and a subsequent SPAM message. Receiving said subsequent message causes said decoder to input information of said message to printer, 221, and causes printer, 221, to initiate a new print paragraph and commence printing information of the information segment of said last named message, beginning with, "Now let us turn to the bond markets." [Simultaneously, the transmission received at said station is also received at other similar stations and causes apparatus at said

other stations to print general message information with user specific information. For example:

Stock prices rose today in heavy trading, and the value of your portfolio went up more than the market.

Now let us turn to the bond markets.

is printed at a particular other station where the computations of a microcomputer, 205, determine that the value of the portfolio of said last named station's subscriber increased at a faster rate than the rate of increase of a particular market average.])

FIG. 7E shows how the audio system of FIG. 7D is added to the video system of FIG. 1 to achieve the full combined medium of television and computers. To the apparatus of FIG. 1, a divider, 202D, is added in the audio transmission path which splits the transmission into two paths and transmits one to the appropriate audio processing apparatus of TV decoder, 203, and the other to microcomputer, 205, at particular apparatus, well known in the art, that has capacity for combining computer synthesized audio into the transmitted audio and that inputs its received audio information to monitor, 202M. Microcomputer, 205, has audio RAM and audio synthesizing and combining capacities. Using precisely the same methods whereby the apparatus of FIG. 7D is caused to input audio information (including user specific audio information) to speaker system, 263, (causing said system, 263, to emit the sound of the voice of the radio announcer as described above), the apparatus of the station of FIG. 7E can be caused to input audio information (including user specific audio information) to the speaker of monitor, 202M, (causing said speaker to emit the sound of the voice of an announcer making the above audio statements). The only difference between the systems of FIGS. 7D and 7E is that SPAM information of the audio of FIG. 7E is transmitted, in the preferred embodiment, in the normal transmission location of television (which means that said information is embedded in the video rather than the audio).

Automating U. R. Stations . . . Examples #9 and #10 continued
Coordinating Computers, Television, and Print

FIG. 7F illustrates a method for generating and communicating information to selected subscribers through the coordination of computers, television, and broadcast print. FIG. 7F also illustrates use of a local input, 225.

The microcomputer, 205, of the station of FIG. 7 and 7F, is preprogrammed to receive and process automatically meal recipe instructions and holds records of the size of the family of the subscriber of said station together with the tastes and dietary habits of the members of said family. For example, particular information is recorded in a file named DATA.sub.-- OF.URS that is on a so-called "floppy disk" that is loaded at the A: disk drive at said microcomputer, 205. Said information specifies that said family prefers particular very hot and spicy foods, prefers to minimize salt consumption, and consists of four adults.

(Simultaneously, a particular second microcomputer, 205, that is at the different station of a second subscriber and is also preprogrammed to receive and process automatically meal recipe instructions, holds information in a file named DATA--OF.URS on a floppy disk that is loaded at its A: disk drive which information specifies that the family of said

second subscriber prefers particular mild foods, is indifferent regarding salt consumption, and consists of two adults. And a particular third microcomputer, 205, that is at another different station of a third subscriber and that is also preprogrammed to receive and process automatically meal recipe instructions, holds information in a file named DATA--OF.URS on a floppy disk that is loaded at its A: disk drive which information specifies that the family of said third subscriber prefers particular moderately hot and spicy foods, is indifferent regarding salt consumption, and consists of two adults and three children.)

The program originating studio of a particular network transmits the programming transmission of a particular conventional television program on cooking techniques that is called "Exotic Meals of India." Said transmission is received at the intermediate transmission station of FIG. 6 and retransmitted immediately on the cable channel of modulator, 83. (Said transmission is also received at the aforementioned second intermediate transmission station of example #10 and retransmitted immediately.)

At the station of FIG. 7 and 7F (which station is a subscriber station of the intermediate station of FIG. 6), in the fashions described above, apparatus is caused to receive the particular transmission of said program that is retransmitted by the intermediate station of FIG. 6; to interconnect in such a way that the audio information received at a tuner, 215, and the video information received at said tuner, 215, are inputted separately, via matrix switch, 258, to monitor, 202M; to retain and process meter and monitor information of the use and usage of the information of said transmission, and to display the television information of said transmission (that is, information of said audio and video) at monitor, 202M. (In other words, because said "Exotic Meals of India" programming is conventional television programming rather than combined medium programming, no information of said programming is inputted to microcomputer, 205, and no programming outputted by microcomputer, 205, is inputted to monitor, 202M.)

(Simultaneously and in the same fashion, apparatus of the station of said second subscriber [which station is a subscriber station of the intermediate station of FIG. 6] receives, interconnects, meters and monitors, and displays at a monitor, 202M, the information of said transmission. And apparatus of the station of said third subscriber [which station is a subscriber station of said second intermediate station] also receives, interconnects, meters and monitors, and displays at a monitor, 202M, the information of the transmission of said program that is transmitted by said second intermediate station.)

The program is devoted to the subject of cooking a particular fish curry that can be mild or moderately hot and spicy or, as a vindaloo, very hot and spicy.

Halfway through the program the host says, "If you are interested in cooking what we are preparing here and want a your own printed copy of the recipe tailored to your own tastes and your own shopping list for a charge of only 10 cents, enter on your Widget Signal Generator and Local Input the information that you see on your screen." The information that appears on the screen of each subscriber is "TV567#".

Each subscriber--in particular, the subscriber of the station of FIGS. 7

and 7F, said second subscriber, and said third subscriber--enters TV567#, in a fashion well known in the art, at the keyboard of the specific local input, 225, of his own station which causes said input, 225, to transmit a particular preprogrammed process-local-input instruction and said TV567# information to the controller, 20, of the signal processor, 200, of said station.

Receiving said instruction and information causes the controller, 20, at each station where TV567# is entered, in a predetermined fashion, to retain said TV567# information at particular last-local-input-# memory.

Five minutes later, said program originating studio embeds in the transmission of the "Exotic Meals of India" programming and transmits a particular first SPAM message that consists of an "01" header, particular execution segment information that is addressed to URS signal processors, 200, appropriate meter-monitor information, padding bits as required, an information segment of particular check-for-entered-information-and-process instructions, and an end of file signal.

At the station of FIGS. 7 and 7F, said message is detected at TV signal decoder, 145, and said execution segment information invokes particular controlled function instructions that cause said message to be transferred to the controller, 20, of signal processor, 200. Automatically, the controller, 39, of decoder, 145, transmits particular switching request information to the control processor, 20A, of signal processor, 200, via the aforementioned control information bus means. Receiving said information causes control processor, 20A, to cause matrix switch, 259, to establish a communications link between said controller, 39, and said controller, 20. Automatically, said controller, 39, transfers said message to said controller, 20.

Receiving said message causes controller, 20, to load and execute said check-for-entered-information-and-process instructions, and executing said instructions causes controller, 20, to determine that TV567# information exists at said last-local-input-# memory and to cause an instance of particular covert control information (which is preprogrammed in said instructions) to be placed at particular control-function-invoking information memory of the controller, 39, of decoder, 145, and also at particular control-function-invoking information memory of the controller, 39, of decoder, 203. Executing said instructions also causes controller, 20, to initiate a particular signal record of meter information at the buffer, 14, of signal processor, 200, which record contains particular program unit information and TV567# information. (At stations where TV567# information does not exist at last-local-input-# memory of the controllers, 20, said instructions cause said controllers, 20, to cease executing and delete all information of said instructions without placing any information at the decoders, 145 and 203, or initiating any meter information.)

(Receiving said first message at the stations of said second and said third subscribers causes apparatus of said station to function in the fashion of the station of FIGS. 7 and 7F.)

One minute later, said program originating studio embeds in the transmission of said "Exotic Meals of India" programming and transmits a particular second SPAM message that consists of an "01" header, particular execution segment information that is identical to said,

covert control information, appropriate meter-monitor information including unit code identification information that identifies the programming of the information segment of said message, padding bits as required, information segment of particular generate-recipe-and-shopping-list instructions, and an end of file signal.

At the station of FIGS. 7 and 7F, said message is detected at TV signal decoder, 145, and said execution segment information invokes particular controlled function instructions that cause said message to be transferred to the controller, 39, of decoder, 203. Automatically, the controller, 39, of decoder, 145, transmits particular switching request information to the control processor, 20A, of signal processor, 200, via the aforementioned control information bus means. Receiving said information causes control processor, 20A, to cause matrix switch, 259, to establish a communications link between the controller, 39, of decoder, 145, and the controller, 39, of decoder, 203. Automatically, said controller, 39, of decoder, 145, transfers said message to the controller, 39, of decoder, 203.

Receiving said message causes the controller, 39, of decoder, 203, to load and execute said generate-recipe-and-shopping-list instructions at microcomputer, 205, and to transfer particular meter-monitor information to the buffer/comparator, 14, of signal processor, 200, causing said buffer/comparator, 14, to increment the information of said signal record of meter information in the fashion described above.

Executing said generate-recipe-and-shopping-list instructions causes microcomputer, 205, to generate information of the specific fish curry recipe and fish curry shopping list of the family of the subscriber of the station of FIGS. 7 and 7F; to cause said recipe and shopping list to be printed at printer, 221; and to retain information of said shopping list at particular memory. Automatically, microcomputer, 205, accesses its A:DATA.sub.-- OF.URS file, in a fashion well known in the art, and selects the aforementioned information that specifies the size of the family of the subscriber of said station together with the tastes and dietary habits of the members of said family; determines that one ingredient of the recipe of said family is "Patak's low-salt Vindaloo Curry Paste" (because said family prefers particular very hot and spicy foods and prefers to minimize salt consumption); computes that, at one-half pound of halibut fish and one teaspoonful of said Vindaloo Paste per adult, the recipe of said family (which is of four adults) calls for two pounds of halibut and four teaspoonfuls of said Paste and that the shopping list of said family lists two pounds of halibut and one jar of "Patak's low-salt Vindaloo Curry Paste"; incorporates information of said two pounds and four teaspoonfuls of "Patak's low-salt Vindaloo Curry Paste" into generally applicable information of the recipe of said "Exotic Meals of India" programming and information of said two pounds and one jar of "Patak's low-salt Vindaloo Curry Paste" into generally applicable information of the shopping list of said programming, thereby generating (through the processes of so determining, computing, and incorporating) output information of the specific recipe and shopping list of said family; records one instance of the output of said shopping list at particular shopping-list memory; and outputs output information of said specific recipe and list to printer, 221.

Receiving said output information causes printer, 221, to print the information of said specific recipe and list.

(Receiving said second message at the stations of said second and said third subscribers causes apparatus of said station to function in the fashion of the station of FIGS. 7 and 7F except that the specific recipe and list information processed, recorded, outputted, and printed at said stations are the specific recipes and lists of the families of said subscribers. The microcomputer, 205, of the station of said second subscriber determines that one ingredient of the recipe of said family is "Patak's Quick Curry Paste (Mild)" (because said family prefers particular mild foods and is indifferent regarding salt consumption); computes that the recipe of said family (which is of two adults) calls for one pound of halibut and two teaspoonfuls of said Paste and that the shopping list of said family lists one pound of halibut and one jar of "Patak's Quick Curry Paste (Mild)"; completes generating; records selectively at particular shopping-list memory; outputs; and causes to be printed output information of the specific recipe and shopping list of said family that reflects the one pound, two teaspoonfuls, and one jar of "Patak's Quick Curry Paste (Mild)" information so determined and computed. The microcomputer, 205, of the station of said third subscriber determines that one ingredient of the recipe of said family is "Patak's Quick Curry Paste (Hot)" (because said family prefers particular moderately hot and spicy foods and is indifferent regarding salt consumption); computes that, at one-half pound of halibut fish and one teaspoonful of said Paste per adult and at one-quarter pound of halibut fish and one-half teaspoonful of said Paste per child, the recipe of said family (which is of two adults and three children) calls for one and three-quarters pounds of halibut and three and one-half teaspoonfuls of said Paste and that the shopping list of said family lists one and three-quarters pounds of halibut and one jar of "Patak's Quick Curry Paste (Hot)"; completes generating; records selectively at particular shopping-list memory; outputs; and causes to be printed output information of the specific recipe and shopping list of said family that reflects the one and three-fourths pounds, three and one-half teaspoonfuls, and one jar of "Patak's Quick Curry Paste (Hot)" information so determined and computed.)

(At stations where TV567# information was not entered at a local input, 225, the decoders, 145, discard all information of said second message because the executions segment information of said message fails to match any controlled-function-invoking information, and receiving said message causes no further processing.)

One benefit of this method of transmitting the information of said generate-recipe-and-shopping-list instructions is that by causing said instructions to be embedded in the transmission of said "Exotic Meals of India" programming this method enables any subscriber who records the transmission of said programming at a recorder/player, 217, to access the embedded information of said instructions automatically in this fashion whenever the recorded transmission of said programming is played back--and in so doing, to cause the signal processor, 200, of his station to process meter-monitor information of said embedded first and second messages anew whenever TV567# is entered at a local input, 225, in the course of the play back of said transmission. However, this method has the drawback of making the information of said instructions relatively vulnerable to programming pirates (who may be able to manipulate and extract said information relatively easily without causing meter information to be transmitted to remote metering stations) because the

embedded location of said instructions is relatively easy to find.

(An alternate method for inputting said second message to the microcomputers, 205, at stations where TV567# is entered at a local input, 225, is to embed said message in a particular second transmission that is different from the transmission of said "Exotic Meals of India" programming and to cause a selected All signal decoder, 290, at each one of said stations to receive said second transmission, thereby causing said decoder, 290, to detect and transfer the information of said second message to the microcomputer, 205, of said station. In this alternate method, executing said check-for-entered-information-and-process instructions of said first SPAM message causes controller, 20, of signal processor, 200, of each one of said stations to cause the tuner, 223, of a selected converter box, 222, to tune said box, 222, to receive said second transmission; to cause the matrix switch, 258, to establish a programming communication link between said selected converter box, 222, and said decoder, 290; to cause the appropriate receiver apparatus of said decoder, 290, to receive said transmission and the appropriate detector and EOFS valve, 39F, to commence detecting an end of file signal; and to cause an instance of particular covert control information that is in said instruction to be placed at particular control-function-invoking information memory of the controller, 39, of said decoder, 290. In due course, said programming originating studio causes the intermediate transmission station to embed an end of file signal then said second message in said second transmission. Transmitting said end of file signal then said second message causes the apparatus of said decoder, 290, to detect and process properly the information of said second message. This method has the advantage of making the information of said instructions relatively invulnerable to programming pirates because the location of said instructions [more precisely, the particular transmission in which said instructions are embedded] is harder to identify without causing meter information [if only of said first message] to be transmitted to remote metering stations.)

(Whichever transmission method is employed the information of said second message can be encrypted and caused to be decrypted in any of the methods described above--for example, in the method of the first message of example #4.)

Toward the end of the transmission of said "Exotic Meals of India" programming and after each microcomputer, 205, that processes the information of said second message records one instance of specific shopping list output information at particular shopping-list memory, said programming origination studio commences the example #10 transmission of the programming of the supermarket chain commercial of Q. While still transmitting said "Exotic Meals of India" programming, said studio embeds and transmits said 0 15 load-set-information message (#10) in the transmission of said programming.

As described above, receiving said message causes intermediate transmission stations, including the station of FIG. 6 and said second intermediate transmission station, each to load the information of particular files, PROGRAM.EXE and DATA.sub.-- OF.ITS, at particular program-set-to-transmit and data-set-to-transmit RAM memories of a computer, 73.

Then said studio ceases transmitting "Exotic Meals of India" programming

for a so-called "commercial break" and commences transmitting the conventional television video and audio information of program unit Q.

Immediately after commencing to transmit said video and audio of Q, said studio transmits said align-URS-microcomputers-205 message (#10), embedded in the programming transmission of Q. Said message consists of a "10" header, and information of a particular SPAM align-subscriber-station-microcomputers-to-receive-combined-medium-computer-programming execution segment that is addressed to URS signal processors, 200, and any required padding bits.

Receiving said message at the station of FIGS. 7 and 7F causes TV signal decoder, 282, to detect said message and execute particular preprogrammed controlled function instructions that cause said decoder, 282, to cause a communications link to be established that links said decoder, 282, via matrix switch, 259, with the controller, 20, of signal processor, 200; to transfer said message to controller, 20; and to transfer particular preprogrammed source mark information that identifies said decoder, 282, as the local source inputting said message to controller, 20. (Decoder, 145, is not preprogrammed with controlled-function-invoking information that matches the execution segment information of said message, and decoder, 145, discards all information of said message.)

Receiving said message causes controller, 20, to combine microcomputer, 205, to the computer system of said program originating studio and to cause the video and audio output transmissions of microcomputer, 205, to be inputted to monitor, 202M. Automatically, controller, 20, determines, in a predetermined fashion, that the television information received at tuner, 215, is displayed at monitor, 202M; that the audio emitted at monitor, 202M, is inputted to said monitor, 202M, via matrix switch, 258, from said tuner, 215; and that the video displayed at monitor, 202M, is also inputted to said monitor, 202M, via matrix switch, 258, from said tuner, 215. Automatically, controller, 20, causes matrix switch, 258, to configure its switches so as to transfer the video information that is inputted to monitor, 202M, also to divider, 4, and to configure its switches so as to transfer the audio information that is inputted to monitor, 202M, also to divider, 202D. In so doing, receiving said message causes the apparatus of said station to combine to the computer system of said program originating studio. Automatically, controller, 20, causes a control information communication link to be established that links controller, 20, and the controller, 39, of decoder, 203, then inputs an interrupt signal of new-channel-input information to said controller, 39. In so doing, receiving said message causes the decoder, 203, of said station to delete all previously received SPAM information and commence discarding all received SPAM information until an end of file signal is detected. Automatically, controller, 20, causes matrix switch, 258, to configure its switches so as to cease transferring audio information inputted from said tuner, 215, to monitor, 202M, and video information inputted from said tuner, 215, to monitor, 202M. Automatically, controller, 20, causes matrix switch, 258, to configure its switches so as to commence transferring audio information inputted from said microcomputer, 205, to monitor, 202M, and video information inputted from said microcomputer, 205, to monitor, 202M. In so doing, receiving said message causes matrix switch, 258, to interconnect the apparatus of said station in the fashion of FIG. 7E.

(Receiving said align-URS-microcomputers-205 message (#10) at the

stations of said second subscriber and of said third subscriber causes apparatus at said stations to function in the station of FIGS. 7 and 7F, apparatus of said stations to combine to the computer system of said program originating studio, to discard received SPAM information, and to interconnect at each of said stations in the fashion of FIG. 7E.)

After an interval that is sufficient to allow apparatus at each subscriber station so to combine and interconnect, said studio transmits said synch-SPAM-reception

message (#10), embedded in the transmission of said programming. Said message consists of a "01" header, information of the aforementioned pseudo-command execution segment, appropriate meter-monitor information that includes the "program unit identification code" information of said programming of Q, any required padding bits, an information segment that contains no binary information, and information of a SPAM end of file signal.

Receiving said message at the station of FIGS. 7 and 7F causes decoder, 203, to detect the end of file signal of said message and to process the next received SPAM information as information of the header of a SPAM message, thereby causing said decoder, 203, to commence identifying and processing the individual SPAM messages of the SPAM information subsequently embedded in the transmission of the programming of Q. In so doing, receiving said message causes decoder apparatus of the station of FIGS. 7 and 7F to commence executing controlled functions in response to SPAM messages transmitted by said program originating studio. (In the fashions described above, receiving said message at decoders, 145 and 282, causes said said decoders, 145 and 282, to process the meter-monitor information of said message and to transmit meter-monitor information to the onboard controller, 14A, of signal processor, 200, and causes said onboard controller, 14A, to initiate signal record information of said programming of Q and process in the fashions described above that include transferring recorded signal record information to one or more remote auditing stations.)

Then immediately, said studio transmits said control-invoking message (#10), embedded in the transmission of said programming. Said message consists of a "00" header, information of a particular control-invoking execution segment that is addressed to URS decoders, 203, appropriate meter-monitor information that includes the "program unit identification code" information of said programming of Q, any required padding bits.

Receiving said message at the station of FIGS. 7 and 7F causes decoder, 203, to input the aforementioned control invoking instructions to its microcomputer, 205, thereby causing microcomputer, 205, to come under control of the computer system of the transmission of said studio. (Decoder, 203, has capacity to turn power on to microcomputer, 205, and receiving said message may cause decoder, 203, first to turn power on to microcomputer, 205, before inputting control invoking instructions.) Automatically, decoder, 203, also transfers meter-monitor information, causing to said onboard controller, 14A, to increment its signal record information of Q in the fashion described above.

(Receiving said synch-SPAM-reception message (#10) and said control-invoking message (#10) at the stations of said second subscriber and of said third subscriber causes apparatus at said stations, in the

same fashion, to come under control of the computer system of said program originating studio.)

(At other stations that lack microcomputer, 205, capacity, that display only the conventional programming of the transmission of Q at a monitor, 202M, and that are preprogrammed to collect monitor information, receiving said messages at decoders, 145 and 282, causes decoders, 145 and 282, and onboard controllers, 14A, of signal processors, 200, to process the meter-monitor information of said message, to initiate signal record information of said programming of Q, and at selected ones of said stations where recorders, 16, record signal record information and equal or exceed predetermined capacity, to transfer recorded signal record information to one or more remote auditing stations.)

Then said studio transmits said transmit-data-module-set message (#10), causing each intermediate transmission station, including the station of FIG. 6 and said second intermediate transmission station, to transmit its specific data-module-set message (#10), as described above.

Receiving the specific data-module-set message (#10) of its intermediate transmission station causes each ultimate receiver station to record one instance of the DATA.sub.-- OF.ITS information in said message in a particular file, named "DATA.sub.-- OF.ITS" at so-called "RAM disk" memory of the microcomputer, 205, of said station. At the station of FIGS. 7 and 7F, receiving the data-module-set message (#10) transmitted by the intermediate transmission station of FIG. 6 causes said message to be detected at decoder, 203, and causes decoder, 203, to load and execute at microcomputer, 205, the information segment of said message (which includes complete information of the aforementioned data file, DATA.sub.-- OF.ITS, of said station). Executing said information causes microcomputer, 205, to place said complete information at a so-called "D:" RAM disk at the RAM of said microcomputer, 205, in a file entitled, at the directory of said disk, "DATA.sub.-- OF.ITS". (Simultaneously, the microcomputer, 205, at the station of said second subscriber [which station is a also subscriber station of the intermediate transmission station of FIG. 6] receives the same data-module-set message (#10) and is caused, in the same fashion, to place complete information said aforementioned data file, DATA.sub.-- OF.ITS, at the "D:" RAM disk at said microcomputer, 205, in a file entitled "DATA.sub.-- OF.ITS". And the microcomputer, 205, at the station of said third subscriber [which station is a subscriber station of said second intermediate transmission station] receives the data-module-set message (#10) of said second intermediate station and is caused, in the same fashion, to place complete information the data file, DATA.sub.-- OF.ITS, of said second intermediate station at the "D:" RAM disk at said microcomputer, 205, in a file also entitled "DATA.sub.-- OF.ITS".) (Alternately, receiving the specific data-module-set message (#10) of its intermediate transmission station may cause each ultimate receiver station to record one instance of the DATA.sub.-- OF.ITS information in said message in a particular file, named "DATA.sub.-- OF.ITS", on appropriate recording medium of a peripheral disk drive, designated drive D:, of the microcomputer, 205, of said station.)

Then said studio transmits said transmit-and-execute-program-instruction-set message (#10), causing each intermediate transmission station, including the station of FIG. 6 and said second intermediate transmission station, to transmit its specific program-instruction-set message (#10),

as described above.

Receiving the specific program-instruction-set message (#10) of its intermediate transmission station causes each ultimate receiver station to record one instance of the PROGRAM.EXE information in said message at particular RAM and execute the information so loaded as a machine language job. At the station of FIGS. 7 and 7F, receiving the program-instruction-set message (#10) transmitted by the intermediate transmission station of FIG. 6 causes said message to be detected at decoder, 203, and causes decoder, 203, to load and execute at microcomputer, 205, the information segment of said message (which is the program instruction set of Q.1 and is the output file, PROGRAM.EXE, of said station). As described above, the information of said segment includes formula-and-item-of-this-transmission information of the higher language line of program code:

Y=1000.00+62.21875+(2.117* X)
compiled and linked to other compiled information. (Simultaneously, the microcomputer, 205, at the station of said second subscriber receives the same program-instruction-set message (#10) and is caused, in the same fashion, to load and execute said program instruction set of Q.1 that is the information of the information segment of said message. And the microcomputer, 205, at the station of said third subscriber receives the program-instruction-set message (#10) of said second intermediate station and is caused, in the same fashion, to load and execute the complete instructions of the output file, PROGRAM.EXE, of said second intermediate station which is the information of the information segment of said last named message and is the program instruction set of Q.2. Said instructions so executed include formula-and-item-of-this-transmission information of the higher language line of program code:

Y=1000.00+132.2362+(2.0882* X)
Compiled and linked to other compiled information.)

Executing the specific program instruction set instructions received at each subscriber station causes the microcomputer, 205, of said station to generate its own specific information of a series of outputs.

Under control of the instructions of said program instruction set of Q.1, the microcomputer, 205, of FIGS. 7 and 7F generates image information of a first video overlay and generates selected information of subsequent overlays in the following fashion. Automatically, in a fashion well known in the art, microcomputer, 205, accesses its file A:DATA.sub.13 OF.URS and locates the aforementioned information of the particular address of the subscriber station of Figs. 7 and 7F the accesses its file D:DATA.sub.-- OF.ITS and locates the aforementioned information of the particular street addresses of each of the markets of said supermarket chain that is in the locality of the intermediate station of FIG. 6. Then automatically, microcomputer, 205, accesses the aforementioned distance-and-relative-location module that, when accessed, computes the shortest vehicle driving distance between any two locations in the local vicinity of the station of FIG. 6 when passed two street addresses of said vicinity and passes to said module and passes to said module the address of said subscriber station and, one at a time, the address of each of said markets. Automatically, under control of the instructions of said module, microcomputer, 205, computes the shortest vehicle distance and the relative direction between said subscriber

station and each of said markets. Then automatically, by comparing distance information, microcomputer, determines which market is closest to said subscriber station, that the distance between said subscriber station and said market is 4.3 miles, and that said subscriber station is southwest of said market. Automatically, microcomputer, 205, stores particular southwest-quadrant information at particular 1st working memory of said microcomputer, 205. Then automatically, on a machine language basis and in a fashion well known in the art, said microcomputer, 205, substitutes the value 4.3 for the variable X in the equation:

Y=1000.00+62.21875+(2.117* X)
computes the value of Y that is specific the the station of FIGS. 7 and 7F to be: 1071.32 (rounded in a fashion well known in the art); and stores 1071.32 information at particular 2nd working memory of said microcomputer, 205. Automatically, microcomputer, 205, clears video RAM; causes the background color of video RAM to be a color such as black that is transparent when combined with transmitted video by the PC-MicroKey System; causes binary image information of "$1,071.32" to be placed at bit locations of video RAM that produce video image information in the upper left hand of a video screen when video RAM information is transmitted to said screen. (Simultaneously, under control of the instructions of said program instruction set of Q.1, the microcomputer, 205, at the station of said second subscriber computes and determines that the distance between said last named station and the market closest to said station is 8.7 miles and that said station is northwest of said market; stores particular northwest-quadrant information at particular 1st working memory of said microcomputer, 205; substitutes the value 8.7 for the variable X in its received information of said last named equation and computes the value of Y that is specific the station of said second subscriber to be 1080.64 (rounded); stores 1080.64 information at particular 2nd working memory of said microcomputer, 205; clears and sets video RAM to said transparent background color; and causes binary image information of "$1,080.64" to be placed at particular upper left hand video screen bit locations of video RAM. And under control of the instructions of said program instruction set of Q.2, the microcomputer, 205, at the station of said third subscriber computes and determines that the distance between said last named station and the closest selected market in the vicinity of said second intermediate transmission station is 3.2 miles and that said subscriber station is southeast of said market; stores particular southeast-quadrant information at particular 1st working memory of said microcomputer, 205; substitutes the value 3.2 for the variable X in its received information of the equation:

Y=1000.00+132.2362+(2.0882* X)
and computes the value of Y that is specific to the station of said third subscriber to be 1138.92 (rounded); stores 1138.92 information at particular 2nd working memory of said microcomputer, 205; clears and sets video RAM to said transparent background color; and causes binary image information of "$1,138.92" to be placed at particular upper left hand video screen bit locations of video RAM.)

Then, under control of said instructions that constitute the specific program instruction set of the microcomputer, 205, of the station of FIGS. 7 and 7F, said microcomputer, 205, generates and stores additional information of subsequent outputs, selects sound image information of a first audio overlay, and places said selected information at audio RAM.

At the station of FIGS. 7 and 7F, microcomputer, 205, computes the amount that the subscriber of said station will save by buying an untrimmed pork belly unit as compared with buying a trimmed pork belly unit at the aforementioned local market selected at said station. Automatically, microcomputer, 205, locates the aforementioned cost-of-a-trimmed-pork-belly-unit information in its file, D:DATA.sub.-- OF.ITS. Then, by subtracting the information stored at said 2nd working memory of said microcomputer, 205, (which is 1071.32) from said cost-of-a-trimmed-pork-belly-unit information (which is 1987.25), microcomputer, 205, automatically computes said amount to be 915.93 and saves information of 915.93 at particular 3rd working memory of said microcomputer, 205. Then microcomputer, 205, selects audio information that represents the percentage saving that said subscriber can save by buying an untrimmed pork belly unit in comparison to a trimmed pork belly unit at said market. Automatically, microcomputer, 205, clears its audio RAM. Then automatically, by dividing the information at said 3rd working memory (which is 915.93) by said cost-of-a-trimmed-pork-belly-unit information (which is 1987.25), microcomputer, 205, computes information of 0.4609 (rounded), which is the decimal equivalent of the percentage saving; determines that said information is greater than 0.4600 and less than 0.4700; and selects the audio information of an announcer's voice saying "forty-six" from among the information of said file, D:DATA.sub.-- OF.ITS; and places said information at audio RAM. (In similar fashion, the microcomputer, 205, at the station of said second subscriber computes information of the amount that the subscriber of said station will save by buying an untrimmed pork belly unit by subtracting the information stored at the aforementioned 2nd working memory of said microcomputer, 205, [which information is 1080.64] from the cost-of-a-trimmed-pork-belly-unit information of the program instruction set instructions received by said microcomputer, 205, [which information is 1987.25]; stores the difference information so computed [which is 896.61] at particular 3rd working memory of said microcomputer, 205; clears the audio RAM of said microcomputer, 205; by dividing the information at said 3rd working memory [which is 896.61] by the cost-of-a-trimmed-pork-belly-unit information [which is 1987.25] at its file, D:DATA.sub.-- OF.ITS, computes information of 0.4562 [rounded], which is the decimal equivalent of the percentage saving of said second subscriber; determines that said information of 0.4562 is greater than 0.4500 and less than 0.4600; selects the aforementioned audio information of an announcer's voice saying "forty-five" from its file, D:DATA OF.sub.-- ITS; and places said information at said audio RAM. And the microcomputer, 205, at the station of said third subscriber computes information of the amount that said subscriber will save by buying an untrimmed pork belly unit by subtracting the information stored at the 2nd working memory of said microcomputer, 205, [which is 1138.92] from the cost-of-a-trimmed-pork-belly-unit information of its file, D:DATA.sub.-- OF.ITS, [which information is 2021.42]; stores the difference information so computed [which is 882.50] at particular 3rd working memory of said microcomputer, 205; clears the audio RAM of said microcomputer, 205; computes information of 0.4366 [rounded], which is the decimal equivalent of the percentage saving of said second subscriber by dividing the information at said 3rd working memory [which is 882.50] by said cost-of-a-trimmed-pork-belly-unit information [which is 2021.42]; determines that said information of 0.4366 is greater than 0.4300 and less than 0.4400; selects the audio information of an announcer's voice saying "forty-three" from its file, D:DATA.sub.-- OF.ITS; and places said information at said audio RAM.)

As each subscriber station microcomputer, 205, completes placing selected information of an announcer's voice at audio RAM, the program instruction set instructions received by said miorocomputer, 205, cause said microcomputer, 205, to pause, in a fashion well known in the art, and wait for an input instruction.

Meanwhile, in the conventional television programming transmission of Q, the video conveys television picture information of a large outdoor barbecue party, and the audio transmits information of an announcer saying:
"Think how much your friends enjoy outdoor barbecues."

Said studio transmits television picture information of the upper torso of a person and audio information of an announcer saying,
"For a limited time only, Super Discount Supermarkets make this special offer to you. Super Discount Supermarkets will deliver to you, at cost, all the pork you need to entertain five hundred people for this low, low price . . . "

Said studio transmits television picture information of the right hand and arm of said person pointing moving to point at the upper left hand corner of the television screen.

At this moment, said studio embeds and transmits said 1st commence-outputting message (#10). Said message consists of a "00" header; execution segment information that is identical to the execution segment of the second message of the "Wall Street Week" example, appropriate meter-monitor information including "program unit identification code" information and overlay number field information, and any required padding bits. And each intermediate transmission station (including the intermediate station of FIG. 6 and said second intermediate station) receives and retransmits said message.

Receiving said message causes each subscriber station that has completed the generation of first overlay image information at video RAM to combine its specific image information with the conventional video information transmitted by said studio and cause its specific monitor, 202M, to display the combined specific image information and transmitted video information. At the station of FIG. 7 and 7F, decoder, 203, detects the information of said message, and receiving said 1st commence-outputting message (#10) causes decoder, 203, to execute "GRAPHICS ON" at the PC-MicroKey system of microcomputer, 205. Automatically, microcomputer, 205, combines its specific video RAM binary image information of "$1,071.32" with its received conventional video information. And automatically $1,071.32 is displayed at the upper left hand corner of the picture screen of monitor, 202M, which is the corner to which the image of the person shown at said screen is pointing. (Simultaneously and in the same fashion, apparatus at the station of said second subscriber causes the specific video RAM image information of said station, which is "$1,080.64", to be displayed at the upper left hand corner of the picture screen of the monitor, 202M, of said station and said subscriber can see the image said person pointing at $1,080.64. And at the station of said third subscriber, in the same fashion, apparatus causes the specific video RAM image information of said station, which is "$1,138.92", to be displayed at the upper left hand corner of the picture screen of the monitor, 202M, of said station and said third subscriber can see the

image said person pointing at $1,138.92.)

Said studio then transmits audio information of the announcer saying: "Super Discount Supermarkets makes this offer--today only--at cost, and this offer represents a saving to you of over."

Then said program originating studio embeds and transmits said 2nd commence-outputting message (#10). Said message consists of a "00" header; particular audio-overlay execution segment information that is addressed to URS microcomputers, 205, appropriate meter-monitor information including "program unit identification code" information and overlay number field information, and any required padding bits. And each intermediate transmission station (including the intermediate station of FIG. 6 and said second intermediate station) receives and retransmits said message.

Receiving said 2nd commence-outputting message (#10) causes each subscriber station that has completed the generation of first audio image information at audio RAM to combine its specific image information to the conventional audio information transmitted by said studio and to emit sound of its combined specific audio information and its received conventional audio information at its specific monitor, 202M. At the station of FIG. 7 and 7F, decoder, 203, detects the information of said message, and receiving said 2nd commence-outputting message (#10) causes decoder, 203, to execute "SOUND ON" at the microcomputer, 205 of said station. Automatically, microcomputer, 205, transmits to monitor, 202M, via audio information transmission means, one instance of the information at the audio RAM of said microcomputer, 205, causing the emission of sound of said audio information, and the subscriber of said station can hear said announcer's voice saying:
"forty-six".
(Simultaneously, the microcomputer, 205, at the station of said second subscriber transmits to the monitor, 202M, of said station, via audio information transmission means, one instance of the information at the audio RAM of said microcomputer, 205, causing emission of sound of said audio information, and said second subscriber can hear said announcer's voice saying:
"forty-five".
And the microcomputer, 205, at the station of said third subscriber transmits to the monitor, 202M, of said station, one instance of the information at the audio RAM of said microcomputer, 205, causing emission of sound of said audio information, and the sound of said announcer's voice saying:
"forty-three"
is what said third subscriber can hear.)

Then after an interval that is long enough for each subscriber station to emit sound of its specific audio RAM information, said studio transmits audio information of the announcer saying:
"percent."

Receiving said 2nd commence-outputting message (#10) causes each subscriber station that outputs audio information in this fashion, immediately after so transmitting one instance of its specific information at audio RAM, to continue executing instructions of its specific program instruction set at the next instruction following the aforementioned pause. Automatically, after outputting one instance of

audio RAM information, each subscriber station clears its audio RAM, selects sound image information of a second audio overlay, and places said selected information at audio RAM. At the station of FIGS. 7 and 7F, microcomputer, 205, clears its audio RAM then determines, in the predetermined fashion of said program instruction set of Q.1, that the shopping list information at particular shopping-list memory at said station includes information of Patak's low-salt Vindaloo Curry Paste. So determining causes said microcomputer, 205, in said predetermined fashion, to select particular sound image information of an announcer's voice saying "low-salt Vindaloo" from among the information of its D:DATA.sub.-- OF.ITS file and to place said selected information at said audio RAM. (In similar fashion, at the station of said second subscriber, the microcomputer, 205, clears its audio RAM; determines that the shopping list information at the shopping-list memory at said station includes information of Patak's Quick Curry Paste (Mild); selects particular sound image information of an announcer's voice saying "Mild version Quick" from its D:DATA.sub.-- OF.ITS file; and places said selected information at said audio RAM. And at the station of said third subscriber, the microcomputer, 205, clears its audio RAM; determines that the information at its shopping-list memory includes information of Patak's Quick Curry Paste (Hot); selects particular sound image information of "Hot version Quick" from its D:DATA.sub.-- OF.ITS file; and places said selected information at said audio RAM.)

As each subscriber station microcomputer, 205, completes placing selected information of an announcer's voice at audio RAM, the program instruction set instructions received by said microcomputer, 205, cause said microcomputer, 205, to pause a second time and wait for an input instruction.

Meanwhile, as said studio continues to transmit television picture information of the person pointing to the upper left hand corner of the television screen, said studio transmits audio information of an announcer saying,

"To confirm this very special limited offer to you in writing, we are now printing, at your printer . . . "

Then said program originating studio embeds and transmits said 3rd commence-outputting message (#10). Said message consists of a "00" header; particular print-output execution segment information that is addressed to URS microcomputers, 205; appropriate meter-monitor information including "program unit identification code" information and overlay number field information; and any required padding bits. And each intermediate transmission station (including the intermediate station of FIG. 6 and said second intermediate station) receives and retransmits said message.

Receiving said 3rd commence-outputting message (#10) causes each subscriber station to commence printing specific offer and coupon information at its printer, 221. At the station of FIGS. 7 and 7F, decoder, 203, detects the information of said message, and receiving said 3rd commence-outputting message (#10) causes decoder, 203, to execute "PRINT OUT" at the microcomputer, 205 of said station. Under control of said program instruction set instructions received by said microcomputer, 205, microcomputer, 205, commences to generate print output information and to transmit said information to printer, 221. Automatically,

microcomputer, 205, transmits to printer, 221, particular print information (that is transmitted to intermediate stations in the generate-set-information message (#10) as generally applicable information of the intermediate generation set of Q and is complied and/or linked to become part of said program instruction sets of Q.1 and Q.2) of "Super Discount Supermarkets offers to deliver at cost one unit of untrimmed pork belly product, suitable for a large outdoor barbecue party, to:". Automatically, microcomputer, 205, accesses the file A:DATA.sub.-- OF.URS, selects information of the aforementioned particular address of the subscriber station of FIGS. 7 and 7F, and causes said information to be printed at printer, 221. Automatically, microcomputer, 205, transmits additional print information of said program instruction set of Q.1 to printer, 221, causing printer, 221, to print: "in exchange for this coupon and the sum of" and "$". Automatically, microcomputer, 205, selects information of the aforementioned 1071.32 at said 2nd working memory and transmits said information to printer, 221, causing printer, 221, to print: "1,071.32". Automatically, microcomputer, 205, transmits additional print information of said program instruction set of Q.1 including information of "15 cents off" and of "Nabisco Zweiback Teething Toast" (incorporated into said generally applicable information at the station of FIG. 6).

At printer, 221, the printed so-called "hard copy" of said offer and coupon information emerges as: ##STR1##

(Simultaneously, at the station of said second subscriber, the decoder, 203, executes "PRINT OUT" at the microcomputer, 205; said microcomputer, 205, transmits to the printer, 221, of said station the same print information of program instruction set of Q.1 together with selected information of the particular address of said second station and of the aforementioned 1080.64 at said 2nd working memory of said microcomputer, 205; and printed hard copy offer and coupon information emerges at said printer, 221, as: ##STR2## And at the station of said third subscriber, the decoder, 203, executes "PRINT OUT" at the microcomputer, 205; said microcomputer, 205, transmits to the printer, 221, of said station its received program instruction set print information [including information of "Cheerios Toasted Oat Cereal" that was incorporated at said second intermediate station into the generally applicable of the said intermediate generation set of Q instead of "Nabisco Zweiback Teething Toast"] together with selected information of the particular address of said second station and of the aforementioned 1138.92 at said 2nd working memory of said microcomputer, 205; and: ##STR3## is the printed hard copy offer and coupon information that emerges at said printer, 221, at the station of said third subscriber.)

Then, having transmitted audio of an announcer saying, "To confirm this very special limited offer to you in writing, we are now printing, at your printer . . . " (whereupon said 3rd commence-outputting message (#10) was transmitted and offer and coupon printing commenced), said studio then transmits audio of said announcer saying,

"the current specials and coupon offers of Super Discount Supermarkets which include a special coupon for you with which you can buy enough pork for your own barbecue party."

(As said announcer makes this statement, the transmitted video image is of said person pointing to the upper left hand corner of the television screen where $1,071.32 continues to be displayed at the station of FIGS. 7 and 7F [while, simultaneously, $1,080.64 is displayed at the station of

said second subscriber, and $1,138.92 is displayed at the station of said third subscriber].)

Then said program originating studio embeds and transmits said 1st cease-outputting message (#10). Said message is identical to the aforementioned third message of the "Wall Street Week" example.

Receiving said 1st cease-outputting message (#10) causes each subscriber station to cease combining and to display only the transmitted video information at its monitor, 202M. At the station of FIGS. 7 and 7F, decoder, 203, detects the information of said message, and receiving said 1st cease-outputting message (#10) causes decoder, 203, to execute "GRAPHICS OFF" at the PC-MicroKey System of microcomputer, 205. In so doing, decoder, 203, causes said PC-MicroKey to cease combining its specific image information with the conventional video information transmitted by said studio, to commence transmitting only the transmitted video information to monitor, 202M.

Receiving said message causes each subscriber station then temporarily to stop generating and outputting said print output information, to prepare to combine a second specific video overlay image, then to resume generating and outputting said print output information. At the station of FIGS. 7 and 7F, receiving said 1st cease-outputting message (#10) causes decoder, 203, after so executing "GRAPHICS OFF", to input the aforementioned clear-and-continue instruction to the CPU of microcomputer, 205. In the preferred embodiment, said instruction is inputted to said CPU as an interrupt signal. Receiving said clear-and-continue instruction as an interrupt signal causes microcomputer, 205, in a fashion well known in the art, to cease its current function, to store particular information at particular instruction-at-which-to-resume memory that identifies the location of the particular instruction at which to resume said function, and to execute a particular when-interrupted portion of said program instruction set of Q.1. Automatically, microcomputer, 205, ceases generating and transmitting said print output information, having just outputted information of "in exchange for this coupon and the sum of:" which causes printer, 221, to stop printing after printing "of:". (Simultaneously, receiving the interrupt signal of its station's clear-and-continue instruction at the microcomputer, 205, of the station of said second subscriber causes said microcomputer, 205, to cease generating and outputting its specific print output information, having just outputted information of "222 Second St." which causes the printer, 221, of said station to stop printing after printing "St.". And receiving its station's clear-and-continue instruction at the microcomputer, 205, of the station of said third subscriber causes said microcomputer, 205, to cease generating and outputting its specific print output information, having just outputted information of "$1,138.92" which causes the printer, 221, of said station to stop printing after printing "0.92".) Then, under control of the instructions of said when-interrupted portion, microcomputer, 205, determines that said clear-and-continue instruction is the first instance of a clear-and-continue instruction that microcomputer, 205, has received while under control of said program instruction set of Q.1. So determining causes microcomputer, 205, to place "0" at particular Flag-interrupt register memory of said CPU that is normally "1" then to jump to a particular first-clear-and-continue address of the instructions of said program instruction set of Q.1 and to commence executing first-clear-and-continue instructions at said address.

Automatically, under control of said instructions, microcomputer, 205, clears video RAM; sets the background color of video RAM to a transparent overlay black; determines that the aforementioned 1st working memory of said microcomputer, 205, holds southwest-quadrant information; selects from said D:DATA.sub.-- OF.ITS file information of the aforementioned southwest delivery route telephone number, " 456-1414", and causes binary image information of said number to be placed at bit locations that produce video image information in the lower middle portion of a video screen. (Under control of the first-clear-and-continue instructions of its station's program instruction set of Q.1, the microcomputer, 205, of the station of said second subscriber clears video RAM; sets background to transparent black; determines that the 1st working memory of said microcomputer, 205, holds northwest-quadrant information; and causes binary information of the selected northwest delivery route telephone number, "224-3121", to be placed at particular lower middle video screen bit locations. And under control of the first-clear-and-continue instructions of its station's program instruction set of Q.2, the microcomputer, 205, of the station of said third subscriber clears video RAM; sets background to transparent black; determines that the 1st working memory of said microcomputer, 205, holds southeast-quadrant information; and causes binary information of the selected southeast delivery route telephone number, "623-3000", to be placed at particular lower middle video screen bit locations.) Then said first-clear-and-continue instructions cause microcomputer, 205 to determine that the information at said Flag-interrupt register memory is "0", to place "1" at said Flag-interrupt register memory, and to resume generating and transmitting said print output information by executing the instruction located at the location identified by the information at said instruction-at-which-to-resume memory. Automatically, microcomputer, 205, commences generating and transmitting its specific output information, starting immediately after the aforementioned "of:", thereby causing printer, 221, to print: ##STR4## and the information that follows. (At the station of said second subscriber, the microcomputer, 205, resumes generating and transmitting its specific print output information, executing the instruction whose location is identified by the information at the instruction-at-which-to-resume memory of said microcomputer, 205, thereby causing the printer, 221, of said station to print: ##STR5## and the information that follows. And at the station of said third subscriber, the microcomputer, 205, resumes generating and transmitting its specific print output information, executing the instruction identified by the information at its instruction-at-which-to-resume memory, thereby its printer, 221, to print: ##STR6## and the information that follows.)

(In example #10, receiving said 1st cease-outputting message (#10) causes each subscriber station to cease combining and to display only the transmitted video information at its monitor, 202M; to stop generating and outputting particular output information; to generate second video overlay image information; then to resume generating and outputting said particular output information. The fact that the particular output information generated and outputted is print information that is outputted to a printer is only incidental to the present invention. Receiving said 1st cease-outputting message (#10) could as easily cause each subscriber station to stop generating and outputting then to resume generating and outputting any form of computer output information, outputted to any appropriate computer peripheral device. Said output could be data and/or computer program instructions outputted to a disk

drive and caused to be recorded or outputted to a modem and caused to be transmitted. Said output could be audio and/or video information outputted to a monitor, 202M, and caused to be emitted as sound and/or displayed as picture information.)

Then, having caused locally generated video images cease appearing in the the upper left hand corner of subscriber station television screens (including "$1,071.32" at the station of FIGS. 7 and 7F, "$1,080.64" at the station of said second subscriber, and "$1,138.92" at the station of said third subscriber), immediately said studio ceases transmitting a video image of of said person pointing to the upper left hand corner of the television screen.

Promptly said program originating studio commences transmitting the video image of the so-called "talking head" of said person standing in front of a background image of the logo of said program, "Exotic Meals of India," and transmits audio information of said announcer saying:

"Super Discount Supermarkets is proud to sponsor the television series, `Exotic Meals of India.` Being truly exotic, many of the ingredients, can't be found in average supermarkets, but your friendly Super Discount manager is happy to supply all of these ingredients to your family. Tonight your personal recipe and shopping list call for Patak's"

Then said program originating studio embeds and transmits said 4th commence-outputting message (#10). Said message consists of a "00" header; said audio-overlay execution segment information that is addressed to URS microcomputers, 205; appropriate meter-monitor information including "program unit identification code" information and overlay number field information; and any required padding bits. And each intermediate transmission station (including the intermediate station of FIG. 6 and said second intermediate station) receives and retransmits said message.

Receiving said 4th commence-outputting message (#10) causes apparatus at each subscriber station that has completed the generation of second audio image information at audio RAM to combine its specific audio information to the transmitted audio and to emit sound of its combined audio. At the station of FIG. 7 and 7F, decoder, 203, receiving said 4th commence-outputting message (#10) causes decoder, 203, to execute "SOUND ON" at the microcomputer, 205 of said station. Automatically, microcomputer, 205, transmits to monitor, 202M, via audio information transmission means, one instance of the information at the audio RAM of said microcomputer, 205, causing the emission of sound of said audio information, and the subscriber of said station can hear said announcer's voice saying:

"low-salt Vindaloo".

(Simultaneously, the microcomputer, 205, at the station of said second subscriber transmits to the monitor, 202M, of said station, via audio transmission means, one instance of its information at audio RAM, and said second subscriber can hear said announcer's voice saying

"Mild version Quick".

And at the station of said third subscriber, emission at the monitor, 202M, of sound of said announcer's voice saying

"Hot version Quick"

is caused by the microcomputer, 205.)

(The instructions of the program instruction sets of Q.1 and Q.2 do not cause subscriber stations to clear audio RAM after the audio combining caused by receiving said 4th commence-outputting message (#10).)

Then after an interval that is long enough for each subscriber station to emit sound of its specific audio RAM information, said studio transmits audio information of the announcer saying:
"Curry Paste. Your local Super Discount Supermarket has a complete line of Patak's Curry Paste products in stock. Call the telephone number,"

At this moment, said program originating studio embeds and transmits said 5th commence-outputting message (#10). Said message consists of a "00" header; execution segment information that is identical to the execution segment of the second message of the "Wall Street Week" example, appropriate meter-monitor information including "program unit identification code" information and overlay number field information, and any required padding bits. And each intermediate transmission station (including the intermediate station of FIG. 6 and said second intermediate station) receives and retransmits said message.

Receiving said message causes each subscriber station that has completed the generation of second overlay image information at video RAM to combine its specific image information with the conventional video information transmitted by said studio and cause its specific monitor, 202M, to display the combined video information. At the station of FIG. 7 and 7F, receiving said 5th commence-outputting message (#10) causes decoder, 203, to execute "GRAPHICS ON" at the PC-MicroKey system of microcomputer, 205. Automatically, microcomputer, 205, combines its specific video RAM binary image information of "456-1414" with its received conventional video information. And automatically 456-1414 is displayed in the lower middle portion of the picture screen of monitor, 202M. (Simultaneously and in the same fashion, apparatus at the station of said second subscriber causes the specific video RAM image information of said station, which is "224-3121", to be displayed in the lower middle portion of the picture screen of the monitor, 202M, of said station. And at the station of said third subscriber, in the same fashion, apparatus causes the specific video RAM image information of said station, which is "623-3000", to be displayed in the lower middle portion of the picture screen of the monitor, 202M, of said station.)

Said studio then transmits audio information of the announcer saying, "that you see on your screen to have your order delivered to your door. Or if you enter on your Widget Signal Generator and Local Input the information that you see here on your screen,"

Said studio transmits video information of said person pointing to the upper left hand corner of the video screen, and the image of "TV568*" appears in said corner. Thus each viewer--including the subscriber of the station of FIGS. 7 and 7F, said second subscriber, and said third subscriber--can see TV568* in the upper left hand corner of the picture on the monitor, 202M, of his station.

Said studio then transmits audio information of the announcer saying, "your Super Discount manager will see that all the ingredients that you need for your personal `Exotic Meals of India` fish curry recipe are delivered to you in time for dinner tomorrow. And as a special inducement to enter "TV568*" on your Widget Signal Generator and Local

Input now, your manager promises to include one jar of Patak's"

Then said program originating studio embeds and transmits said 6th commence-outputting message (#10). Said message is identical to the 4th commence-outputting message (#10) except for different overlay number field information.

In the same fashion that applied to receiving the 4th commence-outputting message (#10), receiving the 6th commence-outputting message (#10) causes apparatus at each subscriber station that has completed the generation of second audio image information to combine its specific audio information to the transmitted audio and to emit sound of its combined audio. At the station of FIG. 7 and 7F, decoder, the monitor, 202M, emits sound of said announcer's voice saying:
"low-salt Vindaloo".
(Simultaneously, the monitor, 202M, of the station of said second subscriber emits sound of said announcer's voice saying:
"Mild version Quick".
And at the station of said third subscriber, sound of said announcer's voice saying:
"Hot version Quick"
is emitted at the monitor, 202M.) After causing emission of audio information of the information at audio RAM once, the instructions of said program instruction sets of Q.1 and Q.2 cause a microcomputer, 205, to clear audio RAM then pause.

Then after an interval that is long enough for each subscriber station to emit sound of its specific audio RAM information, said studio transmits audio information of the announcer saying:
"Curry Paste. Do it now- Enter `TV568*` on your Widget Signal Generator and Local Input or call the telephone number that you see on your television screen."

At the station of FIGS. 7 and 7F, the subscriber enters TV568* at the keyboard of local input, 225, which causes said input, 225, to transmit the aforementioned process-local-input instruction and said TV568* information to the controller, 20, of the signal processor, 200, of said station. (And at the station of said third subscriber, said third subscriber enters TV568* at the keyboard of his local input, 225.)

Receiving said instruction and information causes the controller, 20, at each station where TV568* is entered, in a predetermined fashion, to retain said TV568* information at particular last-local-input-* memory.

Coincidently, said program originating studio embeds and transmits said 2nd cease-outputting message (#10). Said message is identical to the aforementioned third message of the "Wall Street Week" example.

Receiving said 2nd cease-outputting message (#10) causes each subscriber station to cease combining and to display only the transmitted video information at its monitor, 202M. At the station of FIGS. 7 and 7F, receiving said 2nd cease-outputting message (#10) causes decoder, 203, to execute "GRAPHICS OFF" at the PC-MicroKey System of microcomputer, 205. Automatically, said PC-MicroKey ceases combining its specific image information with the conventional video information transmitted by said studio, and the image of 456-1414 disappears from the lower middle portion of the picture screen of monitor, 202M. (Simultaneously and in

the same fashion, at the station of said second subscriber, the image of 224-3121 disappears from the lower middle portion of the picture screen of the monitor, 202M, and at the station of said third subscriber, the image of 623-3000 disappears from the lower middle portion of the picture screen of the monitor, 202M.)

Receiving said 2nd cease-outputting message (#10) causes each subscriber station then to clear video RAM and continue executing instructions of its specific program instruction set of Q.1 or Q.2.

In due course, said studio ceases transmitting programming of said program unit of Q and recommences transmitting programming of said "Exotic Meals of India" program.

Subsequently, so continuing executing instructions of its specific program instruction set of Q.1 or Q.2 causes apparatus at each subscriber station where where TV568* has been inputted to a local input, 225, automatically to telephone a shopping list order. At the station of FIGS. 7 and 7F, under control of said program instruction set of Q.1, microcomputer, 205, measures elapsed time, in a fashion well known in the art, and determining that ninety seconds have passed from receiving said 2nd cease-outputting message (#10) causes microcomputer, 205, to input particular check-for-entered-TV568*-and-respond instructions to the controller, 20, of signal processor, 200. Receiving said instructions causes controller, 20, to determine that TV567* information exists at said last-local-input-* memory and to transmit particular TV567*-entered information to microcomputer, 205. Receiving said information causes microcomputer, 205, under control of said program instruction set of Q.1, to access said D:DATA.sub.-- OF.ITS file; to select information from said file of the aforementioned local-automatic-order-taking telephone number of the supermarket chain applicable in the vicinity of the intermediate transmission station of FIG. 6 which is 1(800) 247 -8700; to transmit to controller, 20, particular call-this-number-and-respond-with- "A:SHOPPING.EXE" instructions and information of 1-(800) 247-8700; and to record particular instructions at the recording medium of the disk at the A: disk drive of microcomputer, 205, in a file named "SHOPPING.EXE". Receiving said.call-this-number-and-respond-with-"A:SHOPPING.EXE" instructions and information of 1-(800) 247-8700 causes controller, 20, in the fashion described above, to cause auto dialer, 24, to dial the telephone number, 1-(800) 247-8700. Automatically, in the fashion described above, controller, 20, establishes telephone communications with a computer of said super market chain at a remote station. Then said call-this-number-and-respond-with-"A:SHOPPING.EXE" instructions cause controller, 20, to cause the instruction "A:SHOPPING.EXE" to be entered to microcomputer, 205. Entering said instruction causes microcomputer, 205, to execute the instructions of said file, "SHOPPING.EXE" as a machine language job. Under control of said instructions, microcomputer, 205, transmits via controller, 20, to said computer at a remote station information of the street address of the station of FIGS. 7 and 7F (selected from the file, A:DATA.sub.-- OF.URS) and complete information of the aforementioned file, A:SHOPPING.LST, which is the shopping list of the subscriber of said station. (At the station of said second subscriber where TV567* has not been entered at the local input, 225, the controller, 20, does not transmit TV567*-entered information to the microcomputer, 205, and all apparatus cease functioning under control of program instruction set of Q.1 instructions. And at the station of said third subscriber where TV567* has been entered at the local input, 225,

in similar fashion, the instructions of the program instruction set of Q.2 cause apparatus to telephone the aforementioned local-automatic-order-taking telephone number of the vicinity of said second intermediate station which is 1-(800) 371-2100 and to transmit information of the street address and shopping list of said third subscriber.)

In due course, after sufficient time has elapsed for each subscriber station where TV567* has been entered at a local input, 225, to record information of a file named "SHOPPING.EXE" at a disk drive, said program originating studio embeds and transmits the aforementioned disband-URS-microcomputers-205 message (#10). Said message consists of a "10" header, information of a particular SPAM separate-subscriber-station-microcomputers-from-programming-transmission execution segment that is addressed to URS signal processors, 200, and any required padding bits.

Receiving said message at the station of FIGS. 7 and 7F causes TV signal decoder, 203, to detect said message and input said message to the controller, 20, of signal processor, 200.

Receiving said message causes controller, 20, to separate microcomputer, 205, from the computer system of said program originating studio and to cause the video and audio output transmissions of tuner, 215, to be inputted to monitor, 202M. Automatically, controller, 20, executes particular controlled functions and determines, in a predetermined fashion, that microcomputer, 205, is outputting television audio and video to monitor, 202M, that microcomputer, 205, receives from tuner, 215. Automatically, controller, 20, causes matrix switch, 258, to configure its switches so as to cease transferring audio information and video information inputted from said microcomputer, 205, to monitor, 202M, then to commence transferring audio information and video information inputted from said tuner, 215, to monitor, 202M. Then automatically, controller, 20, causes matrix switch, 258, to cease transferring audio information and video information inputted from tuner, 215, to dividers, 202D and 4, respectively. Automatically, decoder, 203, ceases receiving SPAM information.

Receiving said disband-URS-microcomputers-205 message (#10) may also cause controller, 20, (under control of information and instructions preprogrammed at controller, 20) to cause the microcomputer, 205, of the station of FIGS. 7 and 7F to combine to and commence processing the SPAM information of the computer system of a second program originating studio that is different from said studio that originates the transmission of program unit Q (or in the case of example #9, that is different from the recorder, 76, that transmits the prerecorded programming of Q). In this case, controller, 20, causes appropriate receiver apparatus to receive the transmission of said second studio; causes matrix switch, 258, to input audio and video information of the transmission of said programming to dividers, 202D and 4, respectively; and inputs an interrupt signal of new-channel-input information to the controller, 39, of decoder, 203.

Alternatively, receiving said disband-URS-microcomputers-205 message (#10) may also cause controller, 20, (under control of information and instructions preprogrammed at controller, 20) to cause the microcomputer, 205, revert from broadcast control to local control. In this case, in a predetermined fashion that is functionally the reverse of invoking broadcast control, controller, 20, causes microcomputer, 205, to clear all RAM (except for that portion of RAM containing operating system

information) and all CPU registers and any other designated processors; then to load at RAM the information of a particular file such as "INTERUPT.BAK" that exists at a designated place on a particular disk at a particular disk drive; then to record at particular CPU registers selected information at designated locations at RAM; then to cause said CPU to resume processing in the fashion of a resumption that follows an interrupt and that is well known in the art. In so doing, controller, 20, causes microcomputer, 205, to revert from broadcast control to local control; to commence processing the particular job that was interrupted when broadcast control was invoked; and to commence so processing said job at the particular instruction at which invoking broadcast control interrupted the processing of said job. (Hereinafter, the steps associated with returning a microcomputer, 205, from broadcast control to local control are called "revoking broadcast control.")

(Receiving said disband-URS-microcomputers-205 message (#10) at the stations of said second subscriber and of said third subscriber causes apparatus at said stations to separate the microcomputers, 205, of said stations from the transmission of said studio that originates the transmission of program unit Q [or in the case of example #9, from the transmission of said recorder, 76] and may cause apparatus at either station, in the preprogrammed fashion of said apparatus, to cause a microcomputer, 205, to combine to and commence processing the SPAM information of the computer system of a program originating studio that is different from said studio [or in the case of example #9, that is different from said recorder, 76] or may cause said apparatus to revoke broadcast control [thereby causing said apparatus to resume processing a station specific local job].)

(NOTE: Except for the content of their meter-monitor information, the messages transmitted in example #9 by the intermediate transmission station of FIG. 6 to the subscriber stations of its field distribution system, 93, are identical to the messages transmitted to the same field distribution a system, 93, in example #10 and cause the same functioning. More precisely, except for their meter-monitor information content, said align-URS-microcomputers-205 message (#9), synch-SPAM-reception message (#9), data-module-set message (#9), program-instruction-set message (#9), 1st commence-outputting message (#9), 2nd commence-outputting message (#9), 3rd commence-outputting message (#9), 1st cease-outputting message (#9), 4th commence-outputting message (#9), 5th commence-outputting message (#9), 6th commence-outputting message (#9), 2nd cease-outputting message (#9), and disband-URS-microcomputers-205 message (#9) are all identical to the messages of like name of example # 10. Furthermore, said program instruction set of Q of example #9 is identical to said program instruction set of Q.1 of example #10. Thus except as regards the collection of meter-monitor record information, transmitting the messages of example #9 causes precisely the same functioning at the stations of FIGS. 7 and 7F and of said second subscriber as is caused by transmitting the messages of example #10.)

(In addition to the above described functioning, transmitting said messages in examples #9 and #10 causes apparatus at subscriber stations of particularly slow microcomputers, 205, said field distribution system, 93, to function in the restoring efficiency fashion described above. Receiving each of said commence-outputting messages causes a decoder, 203, of at least one of said stations to input particular second-condition-test-failed instructions to its associated

microcomputer, 205, causing said microcomputer, 205, to jump to and commence processing additional instructions of its received program instruction set of Q.1 rather than to commence outputting locally generated combined medium programming. For example, receiving said 1st commence-outputting message (#10) (or (#9)) causes at least one decoder, 203, of at least one station to input the aforementioned second-condition-test-failed instructions to a microcomputer, 205, causing at least one microcomputer, 205, to jump to and execute the instructions caused to be executed by the aforementioned clear-and-continue instructions described above. Automatically, said microcomputer, 205, ceases its current function; stores particular information at particular instruction-at-which-to-resume memory that identifies the location of the particular instruction at which to resume said function; executes the aforementioned when-interrupted portion of said program instruction set of Q.1 [or of Q in the case of example #9]; and determines, under control of the instructions of said portion, that said second-condition-test-failed instructions constitute the first instance of video overlay second-condition-test-failed instructions that microcomputer, 205, has received while under control of said program instruction set of Q.1 [or of Q]. So determining causes said microcomputer, 205, to jump to the aforementioned first-clear-and-continue address of the instructions of said program instruction set of Q.1 [or of Q] and to commence executing first-clear-and-continue instructions at said address. Automatically, said microcomputer, 205, clears video RAM; sets the background color of video RAM to transparent black; determines that 1st working memory of said microcomputer, 205, holds particular quadrant information; and causes selected binary image information of said number a telephone number to be placed at bit locations that produce video image information in the lower middle portion of a video screen. Automatically, said microcomputer, 205, places information at particular Flag-interrupt register memory which information causes said microcomputer, 205, subsequently to jump over and not reexecute said first-clear-and-continue instructions. Then automatically, said microcomputer, 205, resumes executing instructions of said program instruction set of Q.1 [or of Q] at the location identified by the information at said instruction-at-which-to-resume memory.)

PREPROGRAMMING RECEIVER STATION OPERATING SYSTEMS

So-called "operating systems" are well known in the art and generally comprise the most basic form of processor control instructions. In order to control fundamental aspects of the processing of any given data file, such as a DATA.sub.-- OF.ITS or DATA.sub.-- OF.URS file, under control of any given computer program, such as a PROGRAM.EXE program, a computer is usually preprogrammed with an operating system that controls such fundamental aspects as, for example, so-called "input/output" functions. One such system that is commonly known as "PC-DOS" or "MS-DOS" is an operating system of the IBM personal computer, commonly known as the "IBM PC." (PC-DOS or MS-DOS is described in Disk Operating System of the IBM Personal Computer Computer Language Series.)

Many computers are designed to hold operating system instructions at RAM. The IBM PC is one such computer. When power is turned on to an IBM PC, under control of particular instructions that are permanently recorded at ROM and are commonly known as "ROM BIOS", said PC accesses a disk at a particular disk drive and loads the instructions of a particular prerecorded file from said disk to particular locations of RAM

in a fashion well known in the art that is commonly known as "booting."

One advantage of recording operating system instructions at memory such as RAM that can be conveniently overwritten relates to expanding system functions. New so-called "routines" can easily be entered into a given system to control existing apparatus of said system in new functions, and the operating system of a given system can be expanded easily to control newly installed apparatus. Thus many versions usually exist of any given operating system which versions have greater or lesser capacities. For example, versions 1.00, 1.10, 2.00, etc. exist of PC-DOS and MS-DOS. Each version has capacity for controlling the operation of an IBM PC, and later versions generally have expanded capacities in comparison to earlier versions.

Efficient operation of any given computer system of the present invention requires capacity to control the preprogramming of the operating system software of receiver station apparatus.

Receiver station apparatus of the present invention is extensive and can vary greatly from station to station. For example, apparatus that requires preprogramming at the station of FIG. 7, includes microcomputer, 205; controllers, 12 and 20, of signal processor, 200; the RAMs associated with the processors, 39B and 39D, and with the control processor, 39J, of decoder, 30, of signal processor, 200; and the RAMs associated with the processors, 39B and 39D, and with the control processor, 39J, of other decoders of said station such as decoders, 203 and 282. Other ultimate receiver stations can include less apparatus, more apparatus, or simply different apparatus. (For example, one receiver station may have the decoder, 203/SPAM controller, 205C, apparatus of example #1 while another station has the preferred decoder, 203, apparatus of example #3.) Furthermore, the complete computer system of a remote network origination and control station such as the program originating studio that transmits the program unit of Q in example #10 involves apparatus not only at ultimate receiver stations but also at intermediate transmission stations.

One objective of the unified system of programming communication of the present invention is standardization of receiver station operating systems. With standardization, any given transmission station such as the program originating studio of example #10 can assemble and take control of a computer system of the computers of selected subscriber stations in the fashion described above in example #7 without any need to preprogram system software at any apparatus of said selected subscriber stations.

Another objective of the present invention is flexibility and convenience in reprogramming operating systems in order to expand system functions.

The present invention provides means and methods whereby one remote system master control station can preprogram all intermediate transmission stations and ultimate receiver station in a given geographical area (such as, for example, the continental United States of America) by transmitting a given sequence of SPAM messages that contain operating system instructions which sequence is received at and processed by all receiver stations and from which selected stations select selected messages that contain instructions of specific relevance. Each message is addressed to specific station SPAM control apparatus such as ITS

computers, 73, in the case of intermediate transmission stations and URS signal processors, 200, in the case of ultimate receiver stations. Each message consists of a "01" header; execution segment information addressed to the appropriate station SPAM control apparatus; meter-monitor information that identifies not only a specific preprogrammable apparatus such as URS decoders, 203, but also the particular version of said apparatus (for example, URS decoders, 203, of the version illustrated above in example #1 rather than example #3); padding bits as required; an information segment that consists, itself, of a particular SPAM message without an end of file signal; and an end of file signal. The information of each information segment consist of a "01" header; execution segment information addressed to said specific preprogrammable apparatus version which segment information causes said apparatus version to invoke its ROM preprogramming instructions; appropriate meter-monitor information that may include particular meter instructions; padding bits as required; and an information segment that contains the operating system instructions of said specific apparatus version.

Each appropriate receiver station apparatus that receives and processes a SPAM message of said sequence is preprogrammed with the necessary controlled-function-invoking information and controlled function instructions invoked by said message, and the information and instructions so invoked are preprogrammed at ROM.

Likewise, each specific receiver station SPA.M control apparatus has access to specific information that is preprogrammed at non-volatile memory that identifies not only the specific preprogrammable apparatus (such as URS decoders, 203) of said station but also the particular version of said apparatus (for example, URS decoders, 203, of the version illustrated above in example #3).

FIG. 8 illustrates the installation of the station specific non-volatile memory apparatus that identifies specific preprogrammable apparatus of the station of FIG. 7. Said specific non-volatile memory apparatus is station specific EPROM, 20B. Station specific EPROM, 20B, is reprogrammed whenever apparatus is installed at or removed from the station of FIGS. 7 and 8 and contains not only information that identifies specific preprogrammable apparatus of said station but also switch control instructions that identify which particular apparatus input to the specific inputs of matrix switch, 259; that identify which particular outputs of said matrix switch, 259, output to which particular station apparatus; and that control switch controller, 20A, in causing matrix switch, 259, to configure its switches to transfer information from one given station apparatus to another. Station specific EPROM, 20B, is mounted in a cartridge and inserted manually into switch controller, 20A, in a fashion well known in the art, at a port in the equipment case of signal processor, 200. Station specific EPROM, 20B, is also preprogrammed with information of a specific operating system master control frequency of the station of FIG. 7. (FIG. 8 also illustrates other selected apparatus and programming and control information transmission means that process SPAM information in the course of the preprogramming of operating system instructions at selected apparatus of the station of FIG. 7.)

At other ultimate receiver stations, other station specific EPROMs, 20B, are installed in the same fashion with each station specific EPROM, 20B, containing programmed information of the specific apparatus and apparatus

versions of its specific station and a specific operating system master control frequency. (Similar station specific non-volatile memory apparatus is installed at each computers, 73, of an intermediate station such as the station of FIG. 6 which non-volatile memory apparatus identifies the specific preprogrammable apparatus of said station.)

An example that focuses, in particular, on preprogramming operating system instructions at the station of FIGS. 7 and 8 illustrates preprogramming receiver station operating systems.

At a particular time such as, for example, 4:00 AM Eastern Standard Time on Jan. 3, 1989, the controller, 20, of the signal processor, 200, of said station causes the oscillator, 6, switch, 1, and mixer, 3, of the signal processor, 200, of the station of FIG. 7 to input a selected frequency to the decoder, 30, and causes said decoder, 30, to commence processing the information of said frequency. Said selected frequency is the specific operating system master control frequency of the information preprogrammed at station specific EPROM, 20B. (Said controller, 20, may be caused so to function in any of the fashions described above that cause a controller, 20, to function. For example, said remote system master control station may transmit particular SPAM message information that causes apparatus at each receiver station, in the fashion of the news items of "AUTOMATING U. R. STATIONS . . . RECEIVING SELECTED PROGRAMMING" above, to tune to and commence processing SPAM information embedded in its preprogrammed specific operating system master control frequency at a selected decoder which decoder is said decoder, 30. Controller, 20, may also cause selected station apparatus such as earth station, 250, and satellite receiver circuitry, 251, to receive the transmission of said frequency and cause selected station apparatus such as matrix switch, 258, to input said transmission to a selected contact of said switch, 1.)

At 4:01 AM, said remote system master control station transmits a SPAM end of file signal causing each receiver station, including the station of FIGS. 7 and 8, to commence identifying and processing the individual SPAM messages embedded in said transmission.

Then said remote master control station commences transmitting said sequence of SPAM messages that contain operating system instructions causing each receiver station to select those specific SPAM messages that contain information applicable to specific preprogrammable apparatus and to program said apparatus.

Said remote station transmits a first SPAM message that contains meter-monitor information of an APPLE II microcomputer, 205, apparatus version and an information segment that contains SPAM message information of APPLE II microcomputer operating system instructions. (APPLE II microcomputers are well known in the art.)

Receiving said message causes the apparatus of the station of FIGS. 7 and 8 to determine that the microcomputer, 205, of said station is not an APPLE II microcomputer and to discard all information of said message. Automatically, decoder, 30, detects said message and executes particular controlled function instructions that cause decoder, 30, to transfer all information of said message, via buffer/comparator, 8, to controller, 12. Automatically, controller, 12, loads the command information (and associated padding bits) of said message at its SPAM-input-signal

register memory, executes particular controlled functions, selects the particular meter-monitor information that identifies a specific preprogrammable apparatus version, and inputs to controller, 20, a particular preprogrammed operating-instructions-received-for-specific-apparatus instruction as an interrupt signal together with said information that identifies a specific apparatus version. Receiving said instruction and information causes controller, 20, to transfer said instruction and information to switch controller, 20A, causing switch controller, 20A, to determine, in a predetermined fashion, that no information of an APPLE II microcomputer, 205, exists at station specific EPROM, 20B. So determining causes switch controller, 20A, to transmit a particular preprogrammed discard-operating-system-message instruction to controller, 20, causing controller, 20, to transmit said instruction to controller, 12. Receiving said instruction causes controller, 12, to discard all information of said first SPAM message. (Simultaneously, at stations where the microcomputers, 205, are APPLE II microcomputers, receiving said first message causes apparatus, in a fashion described more fully below, to cause the operating system instructions of said message to be recorded at disk drives of said APPLE II microcomputers, 205, and so-called "booted" at said APPLE II microcomputers, 205.)

Then said remote station transmits a second SPAM message that contains meter-monitor information of an IBM PC microcomputer, 205, apparatus version and an information segment that contains SPAM message information of IBM PC microcomputer operating system instructions.

Receiving said message causes apparatus of the station of FIGS. 7 and 8 to determine that the microcomputer, 205, of said station is an IBM PC microcomputer and to input the contained SPAM message information of said second SPAM message to decoder, 203. Automatically, decoder, 30, detects said message and transfers all information of said message to controller, 12. Automatically, controller, 12, loads at its SPAM-input-signal memory the command information of said message and any padding bits immediately following said command information, selects the meter-monitor information that identifies a specific preprogrammable apparatus version--that is, an IBM PC--and inputs to controller, 20, said operating-instructions-received-for-specific-apparatus instruction together with said information that identifies an apparatus version. Receiving said instruction and information causes controller, 20, to transfer said instruction and information to switch controller, 20A, causing switch controller, 20A, to determine, in a predetermined fashion, that said meter-monitor information that identifies a specific preprogrammable apparatus version matches information that is preprogrammed at station specific EPROM, 20B, and that identifies specific preprogrammable apparatus of the station of FIGS. 7 and 8--in other words, to determine that an IBM PC is the microcomputer, 205, of said station. So determining causes switch controller, 20A, in a predetermined fashion, to cause matrix switch, 259, to configure its switches so as to transfer information inputted from controller, 12, to decoder, 203, then causes switch controller, 20A, to transmit a particular preprogrammed transfer-operating-system-message instruction to controller, 20, causing controller, 20, to transmit said instruction to controller, 12. Receiving said instruction causes controller, 12, to transmit to matrix switch, 259, all information of said second SPAM message after said command and padding bit information recorded at said SPAM-input-signal register memory. In so doing, controller, 12, transfers the information segment and end of file signal of said second message to matrix switch, 259, and

causes said switch, 259, to input said information to decoder, 203. (Simultaneously, at stations where the microcomputers, 205, are APPLE II microcomputers, receiving said second message causes the controllers, 12, [functioning with controllers, 20 and 20A, and with EPROMs, 20A] to cause all information of said message to be discarded.)

Said information that is inputted to decoder, 203, is the contained SPAM message of said second SPAM message, and having been separated from the command information and immediately following padding bits of said second SPAM message, said contained SPAM message is a SPAM message in its own right. Said contained message consists of a "01" header; execution segment information that is addressed to URS decoders, 203, of IBM PCs and that causes said said decoders, 203, each to invoke its ROM instructions for entering operating system instructions into its microcomputer, 205; appropriate meter-monitor information that may include particular meter instructions; padding bits as required; and an information segment that contains the SPAM operating system instructions of an IBM PC microcomputer. Immediately following the last bit of said information segment is the end of file signal of said second SPAM message which is also the end of file signal of said contained SPAM message. (Another benefit of the message composition fashion of the present invention, which places distinctive signals at the end of messages rather than the beginning, is capacity to transmit any number of contained SPAM messages within the information segment of any given SPAM message that has an information segment and thus that ends with an end of file signal. Said contained messages may be sequential messages or may be nested in the sense of each being contained in the information segment of its preceding message.)

Receiving said contained SPAM message causes decoder, 203, to cause the operating system instructions of said message to be recorded on the recording medium of a disk at a particular disk drive of microcomputer, 205, and to cause microcomputer, 205, to boot the operating system so recorded. Automatically, decoder, 203, executes the controlled functions of its ROM instructions for entering operating system instructions into microcomputer, 205. Automatically, decoder, 205, interrupts the operation of the CPU of microcomputer, 205, and inputs particular instructions to said CPU that cause microcomputer, 205, to load received information in a file at RAM. Automatically, decoder, 203, commences inputting the information segment information of said contained message to microcomputer, 205, and microcomputer, 205, records said inputted information in said file at RAM. Then receiving said end of file signal causes decoder, 203, to cease inputting information segment information to microcomputer, 205, and to cause microcomputer, 205, to record the information of said file in a designated file such as "COMMAND.COM" on a disk at a designated disk drive such as drive A:. In so doing, receiving said message causes the operating system instructions in said message to be recorded at the particular disk drive and in the particular file from which the ROM BIOS of said microcomputer, 205, is preprogrammed to load the operating system of said microcomputer, 205, at boot time. When microcomputer, 205, completes recording the information of said file at said disk drive, microcomputer, 205, inputs particular preprogrammed file-recorded information to decoder, 203. Receiving said file-recorded information causes decoder, 203, under control of said ROM instructions for entering operating system instructions, to turn power to said microcomputer, 205, off then on (which decoder, 205, has capacity to do). Automatically, microcomputer, 205, under control of the instructions of

said ROM BIOS, boots the instructions of the disk drive file A:COMMAND.COM in a fashion well known in the art, loads the operating system instructions of said file (which are the operating system instructions of said contained SPAM message) at operating system memory, and commences to function at so-called "operating system level" under control of said instructions. (Simultaneously, at other stations where the microcomputers, 205, are IBM PC microcomputers, receiving said contained SPAM message of said second SPAM message causes other decoders, 203, and microcomputers, 205, to cause the operating system instructions of said contained message to be recorded and booted in the same fashion.)

Then said remote station transmits a third SPAM message that contains meter-monitor information of a decoder, 203, apparatus of the example #3 version and an information segment that contains SPAM message information of decoder, 203, of example #3 operating system instructions. (The operating system of a SPAM apparatus such as a decoder, 203, contains all instructions required at said apparatus to control the operation of said apparatus. SPAM apparatus operating system instructions include, in particular, the controlled function instructions and controlled-function-invoking information of said apparatus. Permanent operation system instructions of any given SPAM apparatus are recorded at the ROM of said apparatus.)

Receiving said third message causes apparatus of the station of FIGS. 7 and 8 to determine that a decoder, 203, apparatus of the example #3 version exists at said station and to input the contained SPAM message information of said third SPAM message to decoder, 203. Automatically, decoder, 30, detects said message and transfers all information of said message to controller, 12. Automatically, controller, 12, selects the meter-monitor information that identifies a specific preprogrammable apparatus version--that is, an example #3 version of a decoder, 203--and inputs to controller, 20, said operating-instructions-received-for-specific-apparatus instruction together with said information that identifies an apparatus version. Automatically, controller, 20, transfers said instruction and information to switch controller, 20A, causing switch controller, 20A, to determine, in a predetermined fashion, that said information that identifies an apparatus version matches information that is preprogrammed at EPROM, 20B, and that identifies the decoder, 203, of said station. Automatically, switch controller, 20A, causes matrix switch, 259, to configure its switches so as to transfer information inputted from controller, 12, to decoder, 203, then transmits said transfer-operating-system-message instruction to controller, 20, causing controller, 20, to transmit said instruction to controller, 12, and causing controller, 12, to transmit to matrix switch, 259, all information of the information segment and end of file signal of said third SPAM message. In so doing, controller, 12, inputs said information segment and end of file signal to decoder, 203. (Simultaneously, at stations where the decoders, 203, are of the version of example #1, receiving said third message causes controllers, 12, [functioning with controllers, 20 and 20A, and with EPROMs, 20A] to discard all information of said message.)

Said information that is inputted to decoder, 203, is the contained SPAM message of said third SPAM message and is a complete SPAM message in its own right. Said contained message consists of a "01" header; execution segment information that is addressed to URS decoders, 203, of the example #3 version and that causes said said decoders, 203, each to

invoke its ROM instructions for entering operating system instructions into its RAM; appropriate meter-monitor information that may include particular meter instructions; padding bits as required; and an information segment that contains the SPAM operating system instructions of an example #3 version decoder, 203. Immediately following the last bit of said information segment is the end of file signal of said third SPAM message which is also the end of file signal of said contained SPAM message.

Receiving said contained SPAM message causes decoder, 203, to record the operating system instructions of said message at particular operating system locations at the RAMs of decoder, 203, and to commence operating under control of said instructions. Automatically, control processor, 39J, compares the execution segment information of said message to controlled-function-invoking information and determines that said execution segment information matched particular load-operating-system-of-203 information that is preprogrammed at the ROM associated with control processor, 39J, and that invokes particular load-operating-system-of-203 instructions that are are preprogrammed at the ROM associated with control processor, 39J. Automatically, control processor, 39J, executes said instructions and, under control of said instructions, causes processor, 39B, to cease receiving information from buffer, 39A, then loads all information of the information segment of said message sequentially at the RAM associated with control processor, 39J, (which has capacity to contain all information of an operating system of an example #3 version decoder, 203) starting at the first bit location of said RAM and overwriting, if necessary, the information of all bit locations of said RAM. Then, receiving interrupt information of an end of file signal from EOFS valve, 39F, causes control processor, 39J, automatically, under control of said load-operating-system-of-203 instructions, to load all information so loaded at selected operating system locations of decoder, 203. Automatically, control processor, 39J, selects particular information at particular first bit locations of said RAM (which information is particular first binary information of the information segment of said contained SPAM message) and determines the composition of the operating system information so recorded at RAM by processing said information in a predetermined fashion under control of said load-operating-system-of-203 instructions. Automatically, control processor, 39J, inputs particular commence-loading-operating-system instructions to processor, 39B; selects the binary information of particular bit locations at said RAM; and inputs said information to processor, 39B, thereby causing processor, 39B, to record said information sequentially at particular operating system locations of the RAM associated with said processor, 39B, beginning at the first bit location of said RAM. Automatically, control processor, 39J, then inputs said commence-loading-operating-system instructions to processor, 39D; selects the binary information of particular bit locations at said RAM associated with said control processor, 39J; and inputs said information to processor, 39D, thereby causing processor, 39D, to record said information sequentially at particular operating system locations of the RAM associated with said processor, 39D, beginning at the first bit location of said RAM. Automatically, control processor, 39J, then selects the binary information of a particular first signal word of bit locations and a particular second signal word of bit locations at said RAM associated with said control processor, 39J; and inputs said selected information separately to EOFS valves, 39F and 39H, thereby causing said valves, 39F and 39H, each to record at its EOFS Standard Word Location

the information of said first signal word of bit locations and at its EOFS Standard Length Location the information of said second signal word of bit locations. In so doing, receiving said third messages may causes said decoder, 203, subsequently to commence detecting end of file signals of new composition and/or length. (In other words, thereafter said valves, 39F and 39H, may detect end of file signals that are composed of, for example, fifteen sequential instances of "11101110" binary information rather than eleven sequential instances of "11111111" binary information.) Automatically, control processor, 39J, then moves selected binary information of particular bit locations at said RAM associated with said control processor, 39J, to particular operating system locations of said RAM, beginning at the first bit location of said RAM. In so doing, control processor, 39J, completes causing all operating system instructions of said contained SPAM message to be located at the appropriate operating system RAM locations of said decoder, 203. Then automatically, under control of said commence-loading-operating-system instructions, control processor, 39J, causes all buffer, non-operating system RAM, and non-operating system register locations of decoder, 203, (except for buffer, 39A) to be cleared; causes all other apparatus of decoder, 203, to commence processing under control of the new operating system instructions; causes processor, 39B, to commence receiving and processing information from buffer, 39A; and commences waiting for information of a SPAM header under control, first, of a particular new operating system instruction that is located at a predetermined location said RAM associated with control processor, 39J. (Simultaneously, at other stations where the decoders, 203, are of the example #3 version, receiving said third SPAM message causes other apparatus to load the operating system instructions of the contained SPAM message of said third message at the appropriate operating system RAM locations of said decoders, 203, and causes said decoders, 203, to come under control of said instructions in the same fashion.)

Subsequently, said remote station transmits additional operating system SPAM messages until one SPAM message has been transmitted that is addressed to each separate version of SPAM apparatus. Each message contains meter-monitor information of its apparatus version and an information segment that contains SPAM message information operating system instructions of said version.

Receiving each message causes apparatus of each receiving station, in the fashions described above, to determine whether an apparatus of the apparatus version identified by the meter-monitor information of said message exists at said station, to input a contained SPAM message to an apparatus of said apparatus version if an apparatus of said apparatus version exists at said station, and to discard all information of said message if no apparatus of said apparatus version exists at said station. (Said contained messages that are addressed to apparatus such as decoder, 30, PRAM controller, 20, and switch controller, 20A, that exist within the equipment case of a signal processor, 200, are inputted to said apparatus from controller, 12, via controller, 20, rather than via matrix switch, 259.)

Receiving each contained SPAM message causes the apparatus version of said message, in the fashion described above, to record the operating system instructions and information of said message to at particular operating system locations at the RAMs and EOFS valves that control the operation of said apparatus and to commence operating under control of

said instructions and information.

Following the transmission of each message, for a particular interval of time no SPAM information is transmitted that is causes any processing at any apparatus of the apparatus version of message. Said interval is the length of time required for the slowest apparatus of said apparatus version to receive said message, record the operating system instructions and information of said message, and commence operating under control of said instructions and information.

The Preferred SPAM Header

An important feature of the preferred embodiment of the present invention is flexibility for expansion while continuing to accommodate, within the unified system, existing information requirements. Subscribers who have simple information demands must have capacity to receive and process simple SPAM messages with simple subscriber station apparatus. Such simple messages may contain, for example, only sixty-four alternate instances of SPAM execution segment binary information, and the optimal length of SPAM execution segment information for such subscribers would be six binary digits. Simultaneously, subscribers who have complex information demands must have capacity to receive and process more complex SPAM messages that control more extensive subscriber station apparatus. Controlling the subscriber station apparatus of subscribers who have complex information demands far more execution segment capacity than is provide by a system that has only six binary digits of execution segment information transmission capacity. And invariably, many different classes of subscriber will exist with different information demands and different optimal SPAM execution segment lengths.

Two objectives of the unified system of the present invention are to provide capacity whereby any given transmission can transmit SPAM messages to all classes of subscribers and capacity whereby the apparatus of subscribers with complex information demands can process not only complex messages but also simple messages. More precisely, the present invention provides means and methods whereby SPAM messages of different execution segment lengths can be transmitted, intermixed on one transmission, and complex SPAM receiver apparatus with capacity to process long SPAM execution segment information can also process short SPAM execution segment information.

In the preferred embodiment these objectives are realized by having SPAM header information identify not only the four alternate message compositions of the simplest preferred embodiment specified above but also many alternate versions of message composition.

In the preferred embodiment, the length of a SPAM header--and of the SPAM-header register memory of any given SPAM apparatus--is the length of one signal word which is one byte of eight binary digits. SPAM messages are composed of varying numbers and sequences of segments of highest priority, intermediate priority, and lowest priority segment information. Complex SPAM receiver apparatus have means and are preprogrammed to process at register memory execution segment information of varying lengths of binary information. And simple SPAM receiver apparatus are preprogrammed to process at RAM and/or ROM SPAM messages that are too complex to be processed at their register memories (if only to discard said messages).

A Summary Example #11 . . . and the General Case

The full scope of the unified system of programming communication of the present invention comprehends and includes all of the above described apparatus and methods in all of their variations.

An example #11 that focuses on generating and communicating information of farmers at a time in the future illustrates a few features of the full scope of the present invention.

In February, 2027, farmers all over Europe make plans regarding which crops to plant for the 2027 growing season. Each farmer is confronted with the problem of deciding what mix of crops is most profitable to grow on his property, given his resources. Each farmer has a subscriber station that is identical to the station of FIG. 7 except that each station has two television recorder/players that are recorder/players, 217 and 217A; two television tuners, 215 and 215A; and a laser disk player, 232. Particular farm information of the specific farm of each farmer is recorded in a file named MY.sub.-- FARM.DAT on a disk at the A: disk drive of the microcomputer, 205, of each station. The recorded data includes, for example, data of the number and size of the individual parcels of property of the farmer's farm, the soil conditions of said parcels, the aspects of said parcels with respect to sunlight and shade, the history of crop rotation of said parcels, the farm equipment of said farmer, and the financial resources of said farmer. Each farmer's laser disc player, 232, is loaded with a so-call "optical disk" on which is recorded a file named "PROPRIET.MOD" that contains encrypted information of a proprietary software module. When accessed, the instructions of said module cause a microcomputer, 205, to analyze any given crop planting plan and generate information of a recommended planting plan and growing method that minimizes the expense of insect and other crop pest damage given maximum revenue.

Elsewhere and at the same time, national planners of each member nation of the European Economic Community seek to formulate agricultural policy for the 2027 growing season and to communicate information of that policy to farmers, thereby influencing the farmers' decisions regarding which crops to plant. Each nation has a national intermediate transmission station that is identical to the intermediate station of FIG. 6 except that it transmits output information of several individual television channels to receiver stations via a satellite in geosynchronous orbit over Europe rather than via a cable field distribution system. At the computer, 73, of each national intermediate transmission station is local-formula-and-item information of specific data, in a file named NATIONAL.AGI, regarding proposed subsidy formulas and items regarding the various alternate crops that farmers of the nation may choose to grow.

Simultaneously, other national planners of each nation seek to formulate other economic policies including tax and revenue raising policies and monetary policies. At the computer, 73, of each national intermediate transmission station, in a file named NATIONAL.TAX, is local-formula-and-item information of specific proposed tax formulas and items regarding, for example, taxes on farm incomes and proposed depreciation schedules of farm equipment. And in a file named NATIONAL.MON is local-formula-and-item information of specific proposed money supply growth rates and interest rates.

Each nation also has a plurality of local governments at which local planners seek to formulate local tax and revenue raising policies and welfare and subsidized employment policies. Each local government has a local intermediate transmission station that is identical to the intermediate station of FIG. 6 and that transmits multiplexed output information of several separate television channels via a cable field distribution system. At the computer, 73, of each local intermediate transmission station, in a file named LOCAL.TAX, is local-formula-and-item information of specific proposed tax formulas and items regarding, for example, income taxes that relate to farmers and property taxes that relate to farm land and equipment. And in a file named LOCAL.EMP is local-formula-and-item information of specific proposed employment subsidy formulas relating to local unemployed persons which formulas vary with respect to the specific education levels of the unemployed.

Just as government planners wish to communicate policy information to and receive response information from farmers, so too, businessmen wish to advertise to farmers the benefits of their goods and proprietary information services and to persuade farmers to respond by ordering their goods and services.

Each farmer's station has capacity and is preprogrammed to receive programming transmitted via satellite by a particular European master network origination and control station and the specific national intermediate transmission station of the specific nation of said farmer and is a subscriber station in the field distribution system of the local intermediate transmission station of the farmer's local government.

At 3:00 AM Greenwich Mean Time on Monday, Feb. 15, 2027, the signal processor of each receiver station in the nations of the European Economic Community--including each national and each local intermediate transmission station and each ultimate receiver station of a farmer--commences receiving information of the particular master transmission of said European master network station. Automatically, the controller, 20, of the signal processor of each receiver station in said nations causes its oscillator, 6, switch, 1, and mixer, 3, to input a selected frequency to its decoder, 30, and causes said decoder, 30, to commence processing the information of said frequency. Said selected frequency is the specific operating system master control frequency of the information preprogrammed at its station specific EPROM, 20B. Automatically each receiver station that is equipped with a satellite earth station (50 in FIG. 6 or 250 in FIG. 7) receives and inputs to its switch, 1, information of a particular master transmission of said European master network station. Then the controller, 20, of the signal processor of the signal processor system, 71, of each intermediate transmission station (of FIG. 6) in said nations causes the computer, 73, of said station to cause apparatus of said station also to retransmit information of said master transmission on the frequency of a selected master channel transmission. Automatically each receiver station that is not equipped with a satellite earth station commences receiving and inputting to its switch, 1, information of said master transmission that is retransmitted on the frequency of a selected master channel transmission of a selected intermediate transmission station.

At 3:10 AM, GMT, said European master network station transmits particular SPAM message information, embedded in the information of said

master transmission, including a SPAM end of file signal and the aforementioned sequence of SPAM messages that contain operating system instructions. In so doing, said European master network station inputs operating system instructions to all SPAM apparatus and receiver station computers, 73, and microcomputers, 205, thereby causing said apparatus and computers, 73 and 205, as described above in "PREPROGRAMMING RECEIVER STATION OPERATING SYSTEMS," to commence operating under control of the instructions of said operating systems.

Causing each signal processor at every receiver station in said nations to commence operating under control of its specific operating system instructions causes apparatus of each signal processor to commence processing sequentially information of a plurality of specific frequencies in the fashion of example #5 to detect program unit identification signal information. One frequency that is processed at each receiver station is the specific operating system master control frequency of the information preprogrammed at the station specific EPROM, 20B, of said station. Said frequency is either said master transmission of said European master network station or a selected master channel transmission of a selected intermediate transmission station upon which information of said master transmission is retransmitted. Thus information of said master transmission is processed at each receiver station for program unit identification information of interest.

In due course, various transmission stations commence embedding program unit identification signal information in programming transmissions and transmitting the transmissions.

Transmitting the programming with said embedded program unit identification information causes signal processors at selected receiver stations each to commence selecting and receiving specific programming of interest in the fashion of "AUTOMATING U. R. STATIONS . . . RECEIVING SELECTED PROGRAMMING." Automatically receiver stations all over said nations commence tuning to different transmissions and receiving selected programming that differs from receiver station to receiver station.

At 3:59 PM, GMT on Monday, Feb. 15, 2027, said European master network station commences embedding in the information of said master transmission and transmitting program unit identification information of a particular combined medium television program, "Farm Plans of Europe."

Farmers and government planners all over Europe wish to receive and interact with the information of said program and have preprogrammed the apparatus of their stations to receive and combined to the programming transmission of said program. Thus so transmitting said program unit identification information of said "Farm Plans of Europe" program causes apparatus at the ultimate receiver stations of farmers in all of said nations to interconnect display (or other output apparatus) to the transmission of said program and to combine to the computer system of said transmission in the fashions described in example #10 and in "AUTOMATING U. R. STATIONS . . . MORE ON EXAMPLE #7 RECEIVING SELECTED PROGRAMMING AND COMBINING SELECTED URS MICROCOMPUTERS, 205, AUTOMATICALLY TO THE COMPUTER SYSTEM OF A SELECTED PROGRAMMING TRANSMISSION." Automatically each ultimate receiver station that is equipped with a satellite earth station, 250, commences transferring received information of said master transmission, via its matrix switch, 258, to its divider, 4, (thereby inputting said received information to its computer, 205, and

its decoder, 203) and commences transferring the television output information of its microcomputer, 205, to its television monitor, 202M, thereby causing display and emission of the television images and sound of said output information. Automatically each receiver station that is not equipped with a satellite earth station tunes its tuner, 215, to receive the specific master channel transmission of its specific selected local intermediate transmission station (which retransmits the master transmission of said European European master network station on its master channel transmission) and commences transferring received information of said master channel transmission, via its matrix switch, 258, to its divider, 4, (thereby inputting said received information to its computer, 205, and its decoder, 203) and commences transferring the television output information of its microcomputer, 205, to its television monitor, 202M, thereby causing display and emission of the television images and sound of said output information.

At 3:59:45 PM, GMT said European master network station embeds in the information of said master transmission and transmits a SPAM message that is addressed to the ITS computers, 73, of intermediate stations that are local stations.

Receiving said message causes each of said local intermediate station automatically to tune selected receiver apparatus to the specific satellite transmission that is the particular second television channel output transmission of its specific national intermediate transmission station and to input the embedded SPAM information of said transmission to its computer, 73, thereby causing said computer, 73, to come under control of the output transmission of the computer, 73, of its national intermediate station.

At 3:59:55 PM, GMT, said European master network station transmits end of file signal information then invokes broadcast control of each national intermediate transmission station computer, 73, and each ultimate receiver station microcomputer, 205, that receives SPAM information of said master transmission. Automatically said European master network station commences controlling directly the computers, 73, of said national intermediate stations and the microcomputers, 205, of said ultimate receiver stations. And said master station causes each national intermediate station computer, 73, to embed in its particular second television channel transmission and to transmit end of file signal information then to invoke broadcast control of the computers, 73, of its specific local intermediate transmission stations.

At 4:00 PM, GMT, said European master network station commences transmitting the conventional television information of said "Farm Plans of Europe" program.

Immediately, said European master network station causes ultimate receiver stations to obscure all video information of said master transmission and display only locally generated information and causes all national intermediate station computers, 73, and ultimate receiver station microcomputers, 205, that are combined to the transmission of said master station to commence receiving SPAM information embedded in the full frame video of said master transmission. Said master station transmits SPAM information that is addressed to URS microcomputers, 205, that causes said microcomputers, 205, to commence combining and displaying locally titles information (while sound is emitted of

transmitted audio theme music) in the fashion described in "CONTROLLING COMPUTER-BASED COMBINED MEDIA OPERATIONS." Then said master station transmits SPAM information that is addressed to ITS computers, 73, of intermediate stations that are national stations and to URS microcomputers, 205, which SPAM information causes decoder apparatus to commence receiving SPAM information embedded in the full frame video of said master transmission at each national intermediate station and each ultimate receiver station where a microcomputer, 205, is combined to the computer system of said master transmission.

Then said European master network station causes said ultimate receiver stations each to commence receiving and emitting at its speaker system, 261, sound information of a selected transmission that transmits audio language information of said "Farm Plans of Europe" program in the specific language that is the primary language of its subscriber. On a selected secondary transmission, said master station transmits, in a fashion well known in the art, a spectrum of radio frequencies containing a plurality of individual frequency transmission each of which expresses the audio of said program in a separate European language including minority languages such as Flemish, Welsh, Basque, etc. (Each local intermediate station receives and retransmits said spectrum on a particular channel frequency spectrum.) Particular specific primary language information is preprogrammed at specific SPAM apparatus (such as, for example, radio decoders, 211). Said master station embeds and transmits particular specific-language SPAM information addressed to said specific SPAM apparatus, and receiving said specific-language information causes said specific apparatus at each ultimate receiver station to tune and emit the sound of the specific primary language of the subscriber of said station (for example, in the fashion of "AUTOMATING U. R. STATIONS . . . COORDINATING A STEREO SIMULCAST."

Next said European master network station transmits in the full frame video of said master transmission a SPAM message that is addressed to ITS computers, 73, of intermediate stations that are national stations and that contains information segment information of a particular national level intermediate generation set. Receiving said message causes each national intermediate transmission station to input to and execute at its computer, 73, the information of said set. (The information of said set and the processing and functioning caused by executing said information are described more fully below.)

Said European master network station then transmits a series of SPAM messages that cause ultimate receiver stations to commence processing combined medium programming of said "Farm Plans of Europe" program and displaying (or otherwise outputting) combined medium information in a particular fashion. First, said master station transmits a SPAM message that causes the signal processor, 200, of each ultimate receiver station to cause its oscillator, 6, switch, 1, and mixer, 3, to input the specific operating system master control frequency of its EPROM, 20B, continuously to its decoder, 30, thereby causing said decoder, 30, to commence processing the information of said frequency continuously. (In so doing, said master station causes SPAM information embedded in said master transmission to be inputted to said signal processor, 200, continuously irrespective of the transmissions inputted to decoders, 145, 203, or 282, and prevents signal processor, 200, from identifying any other programming of interest at its station.) Then said master station embeds and transmits in the full frame video of said master transmission

a SPAM message that is addressed to URS microcomputers, 205, that contains information segment information of a particular first program instruction set. Transmitting said message causes the all ultimate receiver station microcomputers, 205, that are combined to the computer system of the transmission of said master station to commence executing the instructions of said set and to commence generating local video, audio, and print overlay and output information in the fashions described above. Then said master station transmit a SPAM message that causes all SPAM decoder apparatus of all national intermediate stations and all ultimate receiver stations with microcomputers, 205, combined to the transmission of said master station to commence receiving SPAM information embedded in only the normal transmission location of said master transmission; commences embedding SPAM information only in the normal transmission location; and commences transmitting the conventional video of said "Farm Plans of Europe" program. And as said master station transmits conventional video and audio information that shows visually and describes aurally information of general interest to farmers in all of said nations, said master station commences periodically embedding and transmitting SPAM messages that are addressed to URS microcomputers, 205, and that cause specific information of each farmer to be generated, under control of the instructions of said program instruction set, at each ultimate receiver station and that cause locally generated information periodically to be displayed or emitted as sound or printed in the fashion of example #10 at each ultimate subscriber station whose microcomputer, 205, is combined to the computer system of said master transmission.

In the mean time, executing their inputted information of said national level intermediate generation set causes the computers, 73, of said national intermediate stations each to generate information of a specific local level intermediate generation set in the fashion that receiving the intermediate generation set of Q caused different intermediate stations to compute and incorporate specific formula-and-item-of-this-transmission information into generally applicable information of the program instruction sets of Q.1 and Q.2 in example #10. Said national level intermediate generation set includes generally applicable information of national agriculture and economic policy information, of local tax formulas and items and employment subsidy formulas, and of farmers' recommended crop planting plans. Said national level set also contains a particular projected market price at which farmers are projected to be able to sell each alternate crop. Each price is projected on the basis of projected demand for each crop and the aggregate quantity that European farmers are projected to supply. In addition, said national level set contains information of the aggregate amount of farm borrowing. Executing the information of said set causes the computer, 73, of each national intermediate transmission station to access its specific NATIONAL.AGI, NATIONAL.TAX, and NATIONAL.MON files and to compute formula-and-item-of-this-transmission information specific subsidy formulas and items regarding each alternate crop that national farmers may grow, regarding specific tax formulas and depreciation schedules, and regarding specific monetary growth and interest rates, all given the specific market price information of said national level intermediate generation set and the projected aggregate amount of farm borrowing. Having computed said formula-and-item-of-this-transmission information, each computer, 73, is caused to incorporate said information selectively into selected generally applicable information of said national level set, thereby generating at each of said computers, 73, a specific local level

intermediate generation set that applies to the local intermediate transmission stations of its nation.

After an interval of time that is long enough for each national intermediate generation station to generate its specific local level intermediate generation set, said European master network station embeds and transmits a SPAM message that is addressed to ITS, computers, 73, of intermediate stations that are national stations and that instructs said stations to embed and transmit their specific local intermediate sets.

Receiving said message causes the computer, 73, of each national intermediate station to embed in the normal location of its particular second television channel transmission and to transmit a particular SPAM message that is addressed to ITS computers, 73, and that contains information segment information of its specific local level intermediate generation set.

Receiving the specific SPAM message of its national intermediate station causes the computer, 73, of each local intermediate station to execute the contained local level intermediate generation set of said message and to generate information of a specific program instruction set in the fashion that executing the intermediate generation set of Q caused different intermediate stations in example #10 to generate their specific program instruction sets of Q.1 or Q.2. Executing the information of its local level set causes the computer, 73, of each local intermediate station to access its specific LOCAL.TAX and LOCAL.EMP files and to compute formula-and-item-of-this-transmission information of specific local income and property tax formulas and local employment subsidy formulas, all given the specific market price information, the projected aggregate amount of farm borrowing, the specific national subsidy formulas and items regarding each alternate crop that national farmers may grow, the specific national tax formulas and depreciation schedules, and the specific national monetary growth and interest rates that are information of its local level intermediate generation set. Automatically, each computer, 73, of a local intermediate station incorporates its computed information selectively into selected generally applicable information of said local level intermediate generation set, compiles information, and links information, thereby generating its specific program instruction set.

At 4:29:50 PM, GMT, after an interval of time that is long enough for each local intermediate generation station to generate its specific program instruction set, said European master network station transmits a particular SPAM first-master-cueing message (#11) that is addressed to ITS computers, 73, of intermediate stations that are national stations. Receiving said message causes each national intermediate station to generate and embed in the normal location of its particular second television channel transmission a particular SPAM first-national-cueing message (#11) that is addressed to ITS computers, 73, of intermediate stations that are local stations.

Receiving said message causes each local intermediate station to commence playing prerecorded programming loaded at its recorder, 76, and transmitting said programming to its field distribution system, 93, on the television channel transmission that is the master channel transmission of said intermediate station. In so doing, each local intermediate station commences transmitting television information of a

national and local segment of the "Farm Plans of Europe" program. (Each national intermediate station can have transmitted said prerecorded programming to its local intermediate stations and caused said stations to organize said programming in the fashion of examples #8 and #9 or, alternatively, said first-national-cueing message (#11) could cause each local station to commence transmitting on its master channel transmission the its received television transmission of the second television channel output transmission of its specific national intermediate transmission station.)

Automatically each ultimate receiver station that is not equipped with a satellite earth station (and which is, as a consequence, receiving the master transmission of said European master station retransmitted on the master channel transmission of its local intermediate transmission station) commences receiving the programming transmitted by the recorder, 76, of its local intermediate station.

At 4:29:55 PM, GMT, said European master network station embeds in its master transmission and transmits a particular SPAM second-master-cueing message (#11) that is addressed to URS microcomputers, 205.

Only ultimate receiver stations that are equipped with and that receive the information of said master transmission directly by means of satellite earth station apparatus receive said second-master-cueing message (#11), and receiving said message causes said stations each to receive and process the combined medium programming of the television channel transmission that is the master channel transmission of its particular local intermediate transmission station (of which transmission information is preprogrammed at its EPROM, 20B). Automatically, a tuner, 215, is tuned at each of said stations to receive the particular master channel transmission of the EPROM, 20B, of said station and apparatus of said station interconnects to input the received master channel transmission to the microcomputer, 205, and the decoder, 203, of said station.

In due course, each recorder, 76, transmits prerecorded end of file information then a particular transmit-program-instruction-set SPAM message (#11) addressed to ITS computers, 73.

In the fashion of example #9, each local intermediate station detects the particular SPAM message of its recorder, 76, at its decoder, 77, and receiving its particular message causes each station to embed and transmit end of file signal information then a particular first SPAM message that is addressed to URS microcomputers, 205, and that contains complete information of its particular program instruction set. (In example #11, the local stations are preprogrammed in such a fashion that receiving its specific transmit-program-instruction-set message (#11) causes each station to transmit the program instruction set generated by the local intermediate generation set of its national intermediate station rather than by a prerecorded intermediate generation set previously transmitted by its recorder, 76.) Subsequently, additional SPAM messages that are embedded in said prerecorded programming and that are addressed to URS microcomputers, 205, are transmitted by said recorder, 76.

Receiving the particular first SPAM message of its local intermediate station causes apparatus of the subscriber station of each farmer to

execute the contained program instruction set of said message at the microcomputer, 205, of said station and to commence generating the specific combined medium output information of its subscriber station. And receiving said additional SPAM messages causes apparatus at each subscriber station of a farmer to display or otherwise output (or to cease displaying or otherwise outputting) combined medium program of said national and local segment of the "Farm Plans of Europe" program. Automatically, the display and output apparatus of each farmer's station commences displaying and outputting television picture image, sound, and print information of the national and local agricultural, economic, tax, and employment subsidy policies combined periodically with related locally generated information of specific relevance to each farmer.

So executing a specific contained program instruction set causes each microcomputer, 205, to generate a specific so-called "optimal" solution for its particular farmer's problem of deciding what mix of crops is most profitable to grow on his property, given his resources.

First, each microcomputer, 205, accesses the specific information of its particular farmer. Automatically, under control of its specific received program instruction set, each microcomputer, 205, accesses the file, MY FARM.DAT, that is prerecorded on the disk loaded at its A: disk drive and also accesses the encrypted "PROPRIET.MOD" file that is prerecorded at the laser disc player, 232, of each farmer's station (the information of which last named file is prerecorded by any one of a plurality of proprietary services companies whose information any given farmer may acquire and the information of which varies from farmer's station to farmer's station).

To access the information of its encrypted "PROPRIET.MOD" file, the instructions of its particular program instruction set cause each microcomputer, 205, to decrypt the information of said file and enter the decrypted information of said file at particular RAM. In so doing, said instructions also cause each signal processor, 200, to retain meter information of the decryption of said file. (Selected stations that are preprogrammed to retain monitor information are also caused to retain monitor information.) The information of said file is embedded in the so-called "full frame" video at a laser disc loaded at the disk player, 232, of each station intermixed with SPAM messages that control the decryption and metering of the information of said file. Automatically, at the beginning of a particular interval during which its local intermediate station transmits no SPAM message information to URS microcomputers, 205, instructions of its particular program instruction set cause each microcomputer, 205, to instruct its signal processor, 200, to cause its laser disk player, 232, to play. Then, in the fashion of example #7, apparatus of each station are caused to decrypt and retain meter information of the decryption of the encrypted information of said file. (At each station, in a predetermined fashion that is controlled by the instructions of its program instruction set, apparatus is caused, to input the received television information transmitted by the recorder, 76, of its local intermediate station directly from its tuner, 215, to its TV monitor, 202M then to input the decrypted information of its "PROPRIET.MOD" file to its microcomputer, 205, via its decoder, 203, then to recommence inputting inputting said received television information from its tuner, 215, to its TV monitor, 202M, via its divider, 4, and microcomputer, 205.)

Then using linear programming techniques that are well known in the art, each farmer's microcomputer, 205, under control of the particular program instruction set generated and transmitted by its local intermediate station, computes its particular farmer's "optimal" crop planting plan by making reference to said farmer's specific data that includes, for example, the number and size of the individual parcels of property of the farmer's farm, the soil conditions of said parcels, the aspects of said parcels with respect to sunlight and shade, the history of crop rotation of said parcels, the farm equipment of said farmer, and the financial resources of said farmer; by using said data as so-called "constraints"; and by applying information of said program instruction set. Said information that is applied includes the specific market price information and projected aggregate amount of farm borrowing transmitted by said European master network control station as generally applicable information in its outputted national level intermediate generation set; the specific national subsidy formulas and items regarding each alternate crop that national farmers may grow, the specific national tax formulas and depreciation schedules, and the specific national monetary growth and interest rates that were incorporated at the national intermediate station of each farmer into the generally applicable information of said national level intermediate generation set to generate its local level intermediate generation set; and the specific local income and property tax formulas and local employment subsidy formulas that were incorporated at the local intermediate station of each farmer into the generally applicable information of its received local level intermediate generation set to generate its program instruction set (which is the program instruction set received at said farmer's station).

The specific "optimal" crop planting plans so computed vary from station to station and include budget information of projected revenues, expenses, and profits. The plan of one particular farmer calls for planting forty acres of oats and sixty acres of wheat and projects profits of fifteen thousand units of local currency. The plan of a particular second farmer calls for planting fifteen acres of broad beans and five acres of tomatoes and projects profits of thirty thousand units of local currency. The plan of a particular third farmer calls for planting ten acres of red tulips and two acres of blue tulips and projects profits of twenty thousand units of local currency.

Each specific "optimal" crop planting plan may also include so-called "sensitivity analyses" that are well known in the art and information of alternate planting plans that are close to but not quite optimal.

Automatically, under control of its received program instruction set, the microcomputer, 205, of its farmer's station records complete information of said farmer's crop planting plan at its A: disk in a file named PLANTING.DAT.

Then automatically, under control of its particular program instruction set, each farmer's microcomputer, 205, computes and retains information of a particular schedule of spot commercials. Information of twenty-six specific potential commercials of any given schedule are included in the information of its set, and the specific commercials include, for example, commercials for a particular new farm truck, a particular new farm tractor, a particular new farm disk harrow, software of a particular new "PROPRIET.MOD" module for analyzing crop planting plans and generating recommended planting plans in a "new improved fashion," etc.

Under control of the instructions of its particular set, by analyzing the budget information of its farmers crop planting plan, each microcomputer, 205, automatically identifies four commercial spots that are of a particular possible highest potential value to its farmer. For example, by analyzing equipment depreciation information, one microcomputer, 205, determines that its farmer has an old truck, a new tractor, and a new disk harrow and selects, as one of its four commercials, the commercial of the new truck. Meanwhile, another microcomputer, 205, determines that its farmer has an old truck, a new tractor, and a old disk harrow and selects the commercial of the new truck because a new truck is costlier than a disk harrow and may be more valuable to its farmer. Automatically, the microcomputer, 205, of each station inputs to the signal processor, 200, of its station particular schedule information of its four identified commercial spots.

In due course, the recorder, 76, of each local intermediate station transmits further additional SPAM messages that are embedded in its prerecorded programming and that are addressed to URS microcomputers, 205, then transmits a particular local-second-cueing message (#11) that is addressed to ITS computers, 73.

Receiving the further additional SPAM messages of its local intermediate station causes apparatus at each subscriber station of a farmer to display or otherwise output (or to cease displaying or otherwise outputting) further combined medium programming of said national and local segment of the "Farm Plans of Europe" program. Automatically, in the fashion of example #10, the display and output apparatus of each farmer's station commences displaying and outputting generally applicable television picture image, sound, and print information of a crop planting plan combined periodically with related locally generated specific crop planting plan information of its specific farmer. Automatically, crop and budget information of the aforementioned optimal crop planting plan of each farmer is explained in the outputted the generally applicable programming and is displayed, emitted in sound, and printed at the station of each farmer.

Then so transmitting a particular local-second-cueing message (#11) at each local intermediate station causes a decoder, 77, at each station to detect the local-second-cueing message (#11) transmitted at its station and input said message to the computer, 73.

Receiving its local-second-cueing message (#11) causes the computer, 73, of each local intermediate station to embed SPAM message information that is addressed to URS signal processors, 200, in the normal location of its master channel transmission then after a particular interval to cause the video recorder/player, 78, of its station to commence playing and to cause apparatus of its station to transmit the output of said recorder/player, 78, to the field distribution system of said station on the television transmission of a particular second television channel.

Transmitting said SPAM message information at its local intermediate station causes apparatus of each farmer's station to receive and input said information to the signal processor, 200, of said station, and receiving said information causes the signal processor, 200, of said station to cause its tuner, 215A, to commence receiving the transmission of the particular second television channel of its local intermediate station; to cause apparatus of said station to interconnect to transfer

the transmission received at said tuner, 215A, to a selected video recorder/player, 217 or 217A; and to cause said video recorder, 217 or 217A, to prepare to record selected programming.

Then after an interval that is long enough for each of its subscriber stations to prepare a selected recorder/player, 217 or 217A, to record selected programming, each computer, 73, causes said recorder, 78, to commence playing. In so doing, each computer, 73, causes twenty-six program units of commercial spot programming to be transmitted, in series, to its subscriber stations. Each program unit is preceded by embedded program unit identification information of its own that is addressed to URS signal processors, 200.

Automatically, the signal processor, 200, of each station causes its recorder/players, 217 and 217A, in the fashion that applied to computer, 73, and recorders, 76 and 78, in example #8, to record and then to organize to play the selected programming of the selected commercial spots of its station. Automatically, a decoder, 282A, at the tuner, 215A, of each station detects each datum of program unit identification information received at its tuner, 215A, and inputs each datum to the signal processor, 200, of its station. Automatically, said signal processor, 200, causes a selected recorder/player, 217 or 217A, to record selected programming then, after a particular last unit is received, to organize the recorded programming to play according to its schedule previously inputted by its microcomputer, 205.

In due course, the instructions of the program instruction set received at each farmer's station cause a particular module, TELEPHON.EXE, to be recorded at a particular disk drive of the microcomputer, 205, of each farmer's station (in the fashion of the file, "SHOPPING.EXE" in example #10) which, when executed, will permit the farmer to modify the information of his specific crop planting plan and associated budget and to transmit the specific information of his plan (as modified if modified) to a particular data collection computer at a remote station.

Then a particular second-cueing message (#11) that is embedded at the end of the prerecorded national and local segment of the "Farm Plans of Europe" programming at the recorder, 76, of each local intermediate station and that is addressed to URS signal processors, 200, is transmitted and causes the signal processor, 200, of each farmer's station to separate the apparatus of its station from the master channel transmission and second television of its local intermediate station; to cause its recorder/players, 217 and 217A, to commence playing their prerecorded commercial spot programming in the fashion of example #8, and to cause apparatus of its station to interconnect so as to commence generating and displaying (or otherwise outputting) combined medium programming of the programming transmitted by its selected recorder/player, 217 or 217A.

Playing each commercial spot causes the combined medium information of said spot to display information of a particular commercial product such as a truck or a particular service such as a software package; to access the prerecorded "A:PLANTING.DAT" disk file information of a farmer's crop planting plan; in a fashion well known in the art, to generate cost/benefit financial analysis of the incremental benefit of acquiring and using the displayed product or service (by comparison with the farmer's existing product or service of like kind); and to display (or

otherwise output) information of said analysis (if said analysis results in a positive net present benefit).

After studying his specific crop planting plan and associated budget projections, his associated sensitivity analyses, and the output information of the selected commercial spots of his station, each farmer loads and runs his prerecorded module, TELEPHON.EXE, in a fashion well known in the art. Under control of the instructions of the TELEPHON.EXE module of his station controlling the operation of his signal processor, 200, each farmer enters information at his local input, 225, that modifies the information of his file, "PLANTING.DAT," to suit his own wishes and inclinations then executes particular information of said TELEPHON.EXE module that causes the instructions of said module to cause his signal processor, 200, to transmit the information of his "PLANTING.DAT" file, via telephone network in the fashion of example #10, to a computer at a particular remote data collection station.

Over the course of a particular time such as two days, computers at remote data collection stations receive data automatically from each farmer of said nations which data indicates the specific quantity of each crop that each farmer expects to harvest during the 2027 growing season. Automatically, the received data is aggregated, in a fashion well known in the art, at the computer of said European master network origination and control station which allows planners at said station to modify and refine the variables of the national intermediate generation set of said station, especially the projected market prices at which farmers are projected to be able to sell each alternate crop.

The aggregated data is also distributed automatically to computers at the national and local intermediate transmission stations, enabling national and local planners to vary and refine the policy variables of their stations' local-formula-and-item information.

Then, at 3:59 PM, on Thursday, Feb. 18, 2027, the cycle of generating and communicating information of farmers is repeated using the refined variables. Once again farmers receive optimal planting plans, given the new refined variables, and respond with their own plans, causing data to be aggregated at the computer of said European master network origination and control station.

In an iterative fashion well known in the art, this cycle is repeated several times until a satisfactory European master agricultural plan is achieved. Invariable early cycles result in excessive planned planting, but as projected variables are refined in subsequent planning cycles, the excesses are eliminated. Ultimately the planners are able to establish policy formula and item variables at

economic conditions levels that yield socially beneficial while enabling farmers individually to maximize the profitability of their planting plans, subject to their individual resources.

In this fashion, the unified system of programming communication of the present invention facilitates efficient economic planning and decision making.

It is obvious to one of ordinary skill in the art that the foregoing is presented by way of example only and that the invention is not to be

unduly restricted thereby since modifications may be made in the structure of the various parts or in the methods of their functioning without functionally departing from the spirit of the invention. Any SPAM message and any other programming transmission can be caused, through encryption/decryption and other SPAM regulating techniques of the present invention, to take affect fully only selected stations and station apparatus. Because any transmission station can invoke any SPAM controlled function by transmitting a SPAM message with meter-monitor segment informat 'n, invoking any given SPAM controlled function can also cause meter infu .ation and or monitor information to be processed in the fashions described above at apparatus and stations where said controlled function is invoked. Intermediate transmission stations can be equipped with SPAM regulating capacity such as that illustrated in FIG. 4, monitoring capacity such as that illustrated in FIG. 5, and control information switching and bus communications capacity such as that illustrated in FIGS. 7 and 8. Controlling such capacity by means of transmitted SPAM messages, a remote network origination and control station can transmit programming to intermediate transmission stations, regulate and meter the use of said programming at said stations, monitor the use and usage of said programming at said stations, and control communication of control information at said stations all in the fashions that apply above to ultimate receiver stations. And any given transmission station can cause its receiver stations to function automatically not only in the fashions described above in the sections on automating ultimate receiver stations but in any appropriate fashion that a network origination and control station can cause intermediate transmission stations to function automatically.

CLAIMS:

We claim:

1. ~~A method of communicating television program material to a multiplicity of receiver stations each of which includes a television receiver and computer, the computers being adapted to generate and transmit overlay signals to their associated television receivers, said overlay signals causing the display of user specific information related to said program material, and with at least some of said computers being programmed to process overlay modification control signals so as to modify the overlay signals transmitted to their associated receivers, each of said computers being programmed to accommodate a specific user application, comprising the steps of:~~

~~transmitting a video signal containing a television program signal to said receivers,~~

~~transmitting an instruct-to-overlay signal to said receiver stations at a time when the corresponding overlay is not being displayed,~~

~~receiving said video signal at a plurality of receiver stations and displaying said program material on the video receivers of selected ones of said plurality of receiver stations,~~

~~detecting the presence of said instruct-to-overlay signal at said selected receiver stations and coupling said instruct-to-overlay signal to the computers associated with the video receivers of said selected stations, and~~

~~causing said last named computers to generate and transmit their overlay signals to their associated television receivers in response to said instruct-to-overlay signal, thereby to present a display at the selected receiver stations including the television program material~~

~~and the related computer generated overlay, the overlays displayed at a multiplicity of said receiver stations being different, with each display specific to a specific user.~~

~~2. A method according to claim 1, further including the step of transmitting an overlay modification signal to the computers which are programmed to process overlay modification signals, and causing said last named computers to modify their respective overlay signals in response thereto.~~

~~3. A method according to claim 1, wherein said instruct-to-overlay signal is embedded in said video signal outside the range of the television picture.~~

~~4. In a method of communicating television program material to a multiplicity of receiver stations each of which includes a television receiver and computer, the computers being adapted to generate and transmit overlay video signals to their associated television receivers, said overlay signals causing the display of user specific information related to said program material, and with at least some of said computers being programmed to process overlay control sigmals transmitted to their associated receivers, each of said computers being programmed to accommodate a unique user application, the steps of~~

~~transmitting a video signal containing a television program signal to said receiver stations, and~~

~~transmitting an instruct-to-overlay signal at a time when the corresponding overlay is not being displayed to thereby cause selected ones of said computers to generate and transmit their overlay sigmals to their associated television receiver to present a combined display consisting of the television program and the related computer generated overlay, the overlays displayed at a multiplicity of said receiver stations being different, with each display unique to a specific user.~~

~~5. A process according to claim 4, further including the step of transmitting an overlay modification signal to the computers which are programmed to process overlay modification signals.~~

~~6. A method according to claim 4, wherein said instruct-to-overlay signal is embedded in said video signal outside the range of the television picture.~~

~~7. In a method of communicating television program material to a multiplicity of receiver stations each of which includes a television receiver and computer, the computers being adapted to generate and transmit overlay video signals, to their associated television receivers, said overlay signals causing the display of user specific information related to said program material, and with at least some of said computers being programmed to process overlay modification control signals so as to modify the overlay video signals transmitted to their associated receivers, each of said computers being programmed to accommodate a specific user application, and wherein a video signal containing a television program signal and an instruct-to-overlay signal are transmitted to said receiver stations, the steps of~~

~~receiving said video signal at a plurality of receiver stations and displaying said program material on the video receivers of selected ones of said plurality of receiver stations,~~

~~detecting the presence of said instruct-to-overlay signal at said~~

~~selected receiver stations at a time when the corresponding overlay is not being displayed, and coupling said instruct-to-overlay signal to the computers at said selected receiver stations, and~~
~~causing the computers at said selected receiver stations to generate and transmit their overlay video signals to their associated television receivers in response to said instruct-to-overlay signal, thereby to present a combined display at the selected receiver stations consisting of the television program and the related computer generated overlay, the overlays displayed at a multiplicity of said receiver stations being different, with each display specific to a specific user.~~

~~8. A method according to claim 7, further including the step of transmitting an overlay modification signal to the computers which are programmed to process overlay modification signals, and causing said last~~In a signal processor system, carrier transmission receiving means; means for demodulating said carrier transmission to detect an information transmission thereon; detector means for detecting an embedded signal in the information transmission and removing it from said information transmission; first control means responsive to said detected signal to activate and/or deactivate equipment external to said signal processor system; second control means activated by said detected signal to monitor the performance and/or output of said first control means; a recorder means for receiving and recording data collected by said monitor means; and control means for instructing said recorder to direct information recorded thereon to a remote site.

2. In a signal processor, carrier transmission receiving means; means for demodulating said carrier transmission to detect an information transmission thereon; detector means for detecting an embedded signal in the information transmission and for removing said signal from said information transmission; control means responsive to said detected signal to activate and/or deactivate equipment external to said signal processor; monitor means activated by said detected signal to monitor the performanoe and/or output of said external equipment; a recorder means for receiving and recording data collected by said monitor means; control means for instructing said carrier receiving means to receive the appropriate carrier transmission within a predetermined time interval and to direct said received carrier transmission to said demodulating means and said detector means; and control means for instructing said recorder to direct information recorded thereon to a remote site.

3. In a signal processor, carrier transmission receiving means; means for demodulating said carrier transmission to detect an information transmission thereon; detector means for determining the presence or absence of an embedded signal in the information transmission within a predetermined time interval and for detecting said signal and removing it from said information transmission; recorder means for receiving and recording the presence or absence of said detected signal; control means for instructing said carrier receiving means to receive the appropriate carrier transmission within said predetermined time interval and to direct said received carrier transmission to said demodulating means and detector means; control means for instructing said detector means to detect the presence or absence of said embedded signal within said predetermined time interval; and control means for instructing said recorder means to transmit the information recorded thereon to a remote site.

4. In a signal processor, carrier transmission receiving means; means for demodulating said carrier transmission to detect an information transmission thereon; detector means for determining the presence or absence of an embedded signal in said information transmission within a predetermined time interval and for detecting said signal and removing it from said information transmission; buffer means for organizing said detected signals with detected signals from other detector means into a data stream; recorder means for receiving and recording said stream; control means for instructing said carrier receiving means to receive the appropriate carrier transmission within said predetermined time interval and to direct received said carrier transmission to said demodulating means and said detector means; control means for instructing said recorder to direct information recorded thereon to a remote site; control means responsive to some of said detected signals in said data stream to activate and/or deactivate equipment external to said signal processor; and control means responsive to some other of said detected signals in said data stream to alter the location in succeeding information transmissions examined for embedded signals.

5. In a signal processor, carrier transmission receiving means; means for demodulating said carrier transmission to detect an information transmission thereon; detector means for determining the presence or absence of an embedded signal in the information transmission within a predetermined time interval and for detecting said signal and removing it from said information transmission; buffer means for organizing said detected signals with detected signals from other detector means into a data stream; recorder means for receiving and recording said data stream; control means for instructing said carrier receiving means to receive the appropriate carrier transmission within said predetermined time interval and to direct said received carrier transmission to said demodulating means and said detector means; control means for instructing said detector means to detect the presence or absence of said embedded signal within said predetermined time interval; and control means for instructing said recorder to direct information recorded thereon to a remote site.

6. The apparatus as claimed in claim 1 wherein the embedded signal is encrypted and including a decrypter means for decrypting said signal.

7. The apparatus as claimed in claim 2 wherein the embedded signal is encrypted and including a decrypter means for decrypting said signal.

8. The apparatus as claimed in claim 3 wherein the embedded signal is encrypted and including a decrypter means for decrypting said signal.

9. The apparatus as claimed in claim 4 wherein the embedded signal is encrypted and including a decrypter means for decrypting said signal.

10. The apparatus as claimed in claim 2 including means for receiving and detecting embedded signals on a plurality of carrier transmissions.

11. The apparatus as claimed in claim 3 including means for receiving and detecting embedded signals on a plurality of carrier transmissions.

12. The apparatus as claimed in claim 4 including means for receiving and detecting embedded signals on a plurality of carrier transmissions.

13. The apparatus in claim 5 wherein the embedded signal is encrypted and including a decrypter means for decrypting said signal.

14. A method of processing signals including:
(a) the step of receiving a carrier transmission;
(b) the step of demodulating said carrier transmission to detect an information transmission thereon;
(c) the step of detecting and identifying embedded signals on said information transmission;
(d) the step of passing said embedded signals to a device or devices to be controlled based on instructions identified within said embedded signals;
(e) the step of controlling said devices based on the instructions within said embedded signals; and
(f) the step of recording the receipt of and passing to said devices of said embedded signals.

15. A method of processing signals as claimed in claim 14 including the step of decrypting encrypted embedded signals.

16. A method of processing signals as claimed in claim 14 including the step of recording the response of the device or devices to be controlled by the embedded signals for later transmission to a remote site.

17. A method of processing signals as claimed in claim 14 including the step of decrypting an encrypted information transmission.

18. A method of processing signals as claimed in claim 14 including the step of removing a portion of said detected embedded signal.

19. A method of processing signals as claimed in claim 14 including the step of adding a second signal to the information transmission.

20. A method of generating computer output at a multiplicity of receiver stations each of which includes a computer adapted to generate and transmit user specific signals to one or more associated output devices, with at least some of said computers being programmed to process modification control signals so as to modify said computers' method of processing data and generating output information content, each of said computers being programmed to accommodate a special user application, comprising the steps of:
transmitting an instruct-to-generate signal to said computers at a time when corresponding user specific output information content does not exist,
detecting the presence of said instruct-to-generate signal at selected receiver stations and coupling said instruct-to-generate signal to the computers associated with said selected stations, and
causing said last named computer to generate their user specific output information content in response to said instruct-to-generate signal, thereby to transmit to each of their associated output devices an output signal comprising the user specific output information content and the user specific signal of its associated computer, the output signals at a multiplicity of said output devices being different, with each output signal specific to a specific user.

21. A method according to claim 20, wherein said instruct-to-generate signal contains information which, when said signal is received by

selected receiver stations, causes said receiver station computers to generate said specific output information, said generation being in accordance with said instruct-to-generate signal information.

22. A method according to claim 20, further including the step of transmitting a modification control signal to at least one computer at a selected receiver station which is programmed to process modification control signals, and causing said at least named computer to modify its ~~named computers to modify their respective overlay video signals~~method of processing data and generating output information content in response thereto.

~~9. Television signal processor means, comprising carrier transmission receiving means, means for demodulating the output of said receiving means to detect a video program signal, means normally coupling said video signal to a television receiver, decoder means for determining the presence or absence of an embedded instruct-to-overlay signal in said video signal at a time when the corresponding overlay is not being displayed, computer means for generating and transmitting video overlay signals, said overlay signals causing the display of user specific information related to said program material, and means connected to said computer means and responsive to said decoder means when the presence of said embedded signal is detected for coupling said overlay signals to said television receiver, the overlays displayed at a multiplicity of said receiver stations being different, with each display specific to a specific user.~~

~~10. Television signal processor means according to claim 9, wherein said means connected to said computer means and responsive to said decoder means disconnects said video program signal from said television receiver upon detection of the absence of said embedded signal.~~

~~11. Television signal processor means according to claim 9, further including means coupled to said computer means for selectively updating said overlay signals.~~

~~12. Television signal processor means according to claim 11, wherein said embedded signal is a periodically recurring signal and wherein said means connected to said computer means and responsive to said decoder means couples said overlay video signals to said television receiver for so long as said embedded signal appears in said video program signal.~~

~~13. Television signal processor means according to claim 9, wherein said overlay video signal represents a graphic overlay.~~23. A method according to claim 20, further including the step of preprogramming at least one of said selected receiver stations to modify its method of processing data and generating output information content in response to said instruct-to-generate signal.

24. In a method of generating computer output at a multiplicity of receiver stations each of which includes a computer adapted to generate and transmit user specific output information content and user specific signals to one or more associated output devices, with at least some of said computers being programmed to process modification control signals so as to modify said computers' method of processing data and generating output information content, each of said computers, being programmed to accommodate a special user application, the steps of:

transmitting an instruct-to-generate signal to said computers at a time when corresponding user specific output information content does not exist, and

causing said last named computers to generate their user specific output information content in response to said instruct-to-generate signal, thereby to transmit to each of their associated output devices an output signal comprising the user specific output information content and the user specific signal of its associated computer, the output signals at a multiplicity of said output devices being different, with each output signal specific to a specific user.

25. In a method of generating computer output at a multiplicity of receiver stations each of which includes a computer adapted to generate and transmit user specific output information content and user specific signals to one or more associated output devices, with at least some of said computers being programmed to process modification control signals so as to modify said computers' method of processing data and generating output information content, each of said computers being programmed to accommodate a special user application, the steps of:

detecting at selected receiver stations the presence of an instruct-to-generate signal transmitted by a transmission source and coupling said instruct-to-generate signal to the computers associated with said selected stations, and

causing said last named computers to generate their user specific output information content in response to said instruct-to-generate signal, thereby to transmit to each of their associated output devices an output signal comprising the user specific output information content and the user specific signal of its associated computer, the output signals at a multiplicity of said output devices being different, with each output signal specific to a specific user.

DATE	SERIAL#	ENTITY	TRANSACTION AS OF JULY 15, 2000		FEE
31-Oct-91	08466887	LARGE	BASIC FILING FEE UTILITY	$	(365.00)
31-Oct-91	08466887	SMALL	BASIC FILING FEE UTILITY	$	365.00
26-Dec-91	07588126	SMALL	UTILITY ISSUE FEE	$	565.00
26-Dec-91	07588126	NOT APPLICABLE	PRINTED COPY OF PATENT W/O COLOR, REGULAR SERVICE	$	30.00
15-Feb-94	08113329	NOT APPLICABLE	SUBMISSION OF I.D.S. UNDER RULE 1.97(c)	$	200.00
02-May-94	08056501	SMALL	UTILITY ISSUE FEE	$	585.00
14-Dec-94	08113329	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$	304.00
14-Dec-94	08113329	SMALL	CLAIMS IN EXCESS OF 20	$	275.00
14-Dec-94	08113329	SMALL	MULTIPLE DEPENDENT CLAIMS	$	120.00
10-Jan-95	08056501	LARGE	UTILITY ISSUE FEE	$	585.00
17-Feb-95	08113329	NOT APPLICABLE	SUBMISSION OF I.D.S. UNDER RULE 1.97(c)	$	210.00
23-Feb-95	08442505	SMALL	BASIC FILING FEE UTILITY	$	480.00
23-Feb-95	08442507	SMALL	BASIC FILING FEE UTILITY	$	669.00
01-Mar-95	08397371	SMALL	BASIC FILING FEE UTILITY	$	507.00
01-Mar-95	08397371	NOT APPLICABLE	RECORDING EACH PATENT ASSIGNMENT, AGREEMENT, OR OTHER PAPER, PER PROPERTY	$	40.00
02-Mar-95	08397636	LARGE	BASIC FILING FEE UTILITY	$	847.00
02-Mar-95	08397636	NOT APPLICABLE	RECORDING EACH PATENT ASSIGNMENT, AGREEMENT, OR OTHER PAPER, PER PROPERTY	$	40.00
14-Mar-95	08397582	LARGE	BASIC FILING FEE UTILITY	$	654.00
14-Mar-95	08397582	NOT APPLICABLE	RECORDING EACH PATENT ASSIGNMENT, AGREEMENT, OR OTHER PAPER, PER PROPERTY	$	40.00
21-Apr-95	08447724	SMALL	BASIC FILING FEE UTILITY	$	(365.00)
05-May-95	08437044	SMALL	BASIC FILING FEE UTILITY	$	365.00
09-May-95	08437045	SMALL	BASIC FILING FEE UTILITY	$	365.00
09-May-95	08437629	SMALL	BASIC FILING FEE UTILITY	$	365.00
09-May-95	08437629	LARGE	BASIC FILING FEE UTILITY	$	365.00
09-May-95	08437635	SMALL	BASIC FILING FEE UTILITY	$	365.00
09-May-95	08437635	LARGE	BASIC FILING FEE UTILITY	$	365.00
09-May-95	08437819	SMALL	BASIC FILING FEE UTILITY	$	365.00
09-May-95	08437864	SMALL	BASIC FILING FEE UTILITY	$	365.00
09-May-95	08437887	SMALL	BASIC FILING FEE UTILITY	$	365.00
09-May-95	08438011	SMALL	BASIC FILING FEE UTILITY	$	365.00
09-May-95	08438206	SMALL	BASIC FILING FEE UTILITY	$	365.00
09-May-95	08438216	SMALL	BASIC FILING FEE UTILITY	$	365.00
09-May-95	08438659	SMALL	BASIC FILING FEE UTILITY	$	365.00
10-May-95	08437791	SMALL	BASIC FILING FEE UTILITY	$	365.00
10-May-95	08437937	SMALL	BASIC FILING FEE UTILITY	$	365.00
12-May-95	08113329	NOT APPLICABLE	SUBMISSION OF I.D.S. UNDER RULE 1.97(c)	$	210.00
13-May-95	08437937	LARGE	BASIC FILING FEE UTILITY	$	365.00

000335

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DATE	SERIAL#	ENTITY	TRANSACTION AS OF JULY 15, 2000	FEE
15-May-95	08437045	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
15-May-95	08437045	LARGE	BASIC FILING FEE UTILITY	$ 365.00
15-May-95	08439668	SMALL	BASIC FILING FEE UTILITY	$ 683.00
15-May-95	08439670	SMALL	BASIC FILING FEE UTILITY	$ 863.00
15-May-95	08440657	LARGE	BASIC FILING FEE UTILITY	$ 376.00
15-May-95	08440837	SMALL	BASIC FILING FEE UTILITY	$ 365.00
15-May-95	08441027	LARGE	BASIC FILING FEE UTILITY	$ 512.00
15-May-95	08441033	SMALL	BASIC FILING FEE UTILITY	$ 365.00
15-May-95	08441575	SMALL	BASIC FILING FEE UTILITY	$ 365.00
15-May-95	08441577	SMALL	BASIC FILING FEE UTILITY	$ 365.00
15-May-95	08441701	SMALL	BASIC FILING FEE UTILITY	$ 365.00
15-May-95	08448977	SMALL	BASIC FILING FEE UTILITY	$ 365.00
16-May-95	08437629	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
16-May-95	08437629	LARGE	BASIC FILING FEE UTILITY	$ 365.00
16-May-95	08437635	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
16-May-95	08437635	LARGE	BASIC FILING FEE UTILITY	$ 365.00
16-May-95	08441749	SMALL	BASIC FILING FEE UTILITY	$ 682.00
16-May-95	08441880	SMALL	BASIC FILING FEE UTILITY	$ 365.00
16-May-95	08441942	SMALL	BASIC FILING FEE UTILITY	$ 376.00
16-May-95	08441996	SMALL	BASIC FILING FEE UTILITY	$ 528.00
16-May-95	08442327	SMALL	BASIC FILING FEE UTILITY	$ 599.00
16-May-95	08442335	SMALL	BASIC FILING FEE UTILITY	$ 631.00
16-May-95	08442369	SMALL	BASIC FILING FEE UTILITY	$ 365.00
16-May-95	08442383	SMALL	BASIC FILING FEE UTILITY	$ 365.00
18-May-95	08435757	SMALL	BASIC FILING FEE UTILITY	$ 365.00
18-May-95	08435758	SMALL	BASIC FILING FEE UTILITY	$ 365.00
19-May-95	08444643	SMALL	BASIC FILING FEE UTILITY	$ 365.00
19-May-95	08444756	SMALL	BASIC FILING FEE UTILITY	$ 365.00
19-May-95	08444758	SMALL	BASIC FILING FEE UTILITY	$ 365.00
19-May-95	08444781	SMALL	BASIC FILING FEE UTILITY	$ 365.00
19-May-95	08444788	SMALL	BASIC FILING FEE UTILITY	$ 365.00
19-May-95	08444887	SMALL	BASIC FILING FEE UTILITY	$ 365.00
19-May-95	08445045	SMALL	BASIC FILING FEE UTILITY	$ 365.00
19-May-95	08445054	SMALL	BASIC FILING FEE UTILITY	$ 365.00
19-May-95	08445290	SMALL	BASIC FILING FEE UTILITY	$ 365.00
19-May-95	08445294	SMALL	BASIC FILING FEE UTILITY	$ 365.00
19-May-95	08445296	SMALL	BASIC FILING FEE UTILITY	$ 365.00
19-May-95	08446553	SMALL	BASIC FILING FEE UTILITY	$ 365.00

DATE	SERIAL#	ENTITY	TRANSACTION AS OF JULY 15, 2000	FEE
19-May-95	08446579	SMALL	BASIC FILING FEE UTILITY	$ 365.00
19-May-95	08447416	LARGE	BASIC FILING FEE UTILITY	$ 365.00
19-May-95	08460387	LARGE	BASIC FILING FEE UTILITY	$ 365.00
22-May-95	08442165	LARGE	BASIC FILING FEE UTILITY	$ 566.00
22-May-95	08444757	SMALL	BASIC FILING FEE UTILITY	$ 365.00
22-May-95	08444786	SMALL	BASIC FILING FEE UTILITY	$ 365.00
22-May-95	08444787	SMALL	BASIC FILING FEE UTILITY	$ 365.00
22-May-95	08445328	SMALL	BASIC FILING FEE UTILITY	$ 365.00
22-May-95	08446430	SMALL	BASIC FILING FEE UTILITY	$ 365.00
22-May-95	08446431	SMALL	BASIC FILING FEE UTILITY	$ 365.00
22-May-95	08446432	SMALL	BASIC FILING FEE UTILITY	$ 365.00
22-May-95	08446494	SMALL	BASIC FILING FEE UTILITY	$ 365.00
22-May-95	08449351	SMALL	BASIC FILING FEE UTILITY	$ 365.00
23-May-95	08446429	SMALL	BASIC FILING FEE UTILITY	$ 365.00
23-May-95	08447380	SMALL	BASIC FILING FEE UTILITY	$ 365.00
23-May-95	08447414	SMALL	BASIC FILING FEE UTILITY	$ 365.00
23-May-95	08447415	SMALL	BASIC FILING FEE UTILITY	$ 365.00
23-May-95	08447416	SMALL	BASIC FILING FEE UTILITY	$ 365.00
23-May-95	08447496	SMALL	BASIC FILING FEE UTILITY	$ 365.00
23-May-95	08447502	SMALL	BASIC FILING FEE UTILITY	$ 365.00
23-May-95	08447611	SMALL	BASIC FILING FEE UTILITY	$ 365.00
23-May-95	08447621	SMALL	BASIC FILING FEE UTILITY	$ 365.00
23-May-95	08447679	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
23-May-95	08447679	LARGE	BASIC FILING FEE UTILITY	$ 365.00
23-May-95	08447724	SMALL	BASIC FILING FEE UTILITY	$ 365.00
23-May-95	08447726	SMALL	BASIC FILING FEE UTILITY	$ 365.00
23-May-95	08447826	SMALL	BASIC FILING FEE UTILITY	$ 365.00
23-May-95	08447908	SMALL	BASIC FILING FEE UTILITY	$ 365.00
23-May-95	08447938	SMALL	BASIC FILING FEE UTILITY	$ 365.00
23-May-95	08447974	SMALL	BASIC FILING FEE UTILITY	$ 365.00
23-May-95	08447977	SMALL	BASIC FILING FEE UTILITY	$ 365.00
23-May-95	08448099	SMALL	BASIC FILING FEE UTILITY	$ 365.00
23-May-95	08448116	SMALL	BASIC FILING FEE UTILITY	$ 365.00
23-May-95	08448141	SMALL	BASIC FILING FEE UTILITY	$ 365.00
23-May-95	08448143	SMALL	BASIC FILING FEE UTILITY	$ 365.00
23-May-95	08448143	LARGE	BASIC FILING FEE UTILITY	$ 365.00
23-May-95	08448175	SMALL	BASIC FILING FEE UTILITY	$ 365.00
23-May-95	08448309	SMALL	BASIC FILING FEE UTILITY	$ 365.00

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DATE	SERIAL#	ENTITY	TRANSACTION AS OF JULY 15, 2000	FEE
23-May-95	08448326	SMALL	BASIC FILING FEE UTILITY	$ 365.00
23-May-95	08448833	SMALL	BASIC FILING FEE UTILITY	$ 365.00
23-May-95	08448916	SMALL	BASIC FILING FEE UTILITY	$ 365.00
23-May-95	08449901	SMALL	BASIC FILING FEE UTILITY	$ 365.00
24-May-95	08437045	LARGE	BASIC FILING FEE UTILITY	$ 365.00
24-May-95	08447529	SMALL	BASIC FILING FEE UTILITY	$ 365.00
24-May-95	08447529	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 65.00
24-May-95	08448643	SMALL	BASIC FILING FEE UTILITY	$ 365.00
24-May-95	08448644	SMALL	BASIC FILING FEE UTILITY	$ 365.00
24-May-95	08448644	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
24-May-95	08448644	LARGE	BASIC FILING FEE UTILITY	$ 365.00
24-May-95	08448794	SMALL	BASIC FILING FEE UTILITY	$ 479.00
24-May-95	08448794	LARGE	BASIC FILING FEE UTILITY	$ 365.00
24-May-95	08448810	SMALL	BASIC FILING FEE UTILITY	$ 365.00
24-May-95	08448915	SMALL	BASIC FILING FEE UTILITY	$ 365.00
24-May-95	08448916	LARGE	BASIC FILING FEE UTILITY	$ 365.00
24-May-95	08448917	SMALL	DESIGN FILING FEE	$ 150.00
24-May-95	08448917	SMALL	DESIGN FILING FEE	$ (150.00)
24-May-95	08448917	SMALL	BASIC FILING FEE UTILITY	$ 365.00
24-May-95	08448917	LARGE	BASIC FILING FEE UTILITY	$ 365.00
24-May-95	08448978	SMALL	BASIC FILING FEE UTILITY	$ 365.00
24-May-95	08448979	SMALL	BASIC FILING FEE UTILITY	$ 365.00
24-May-95	08449097	SMALL	BASIC FILING FEE UTILITY	$ 365.00
24-May-95	08449110	SMALL	BASIC FILING FEE UTILITY	$ 403.00
24-May-95	08449248	SMALL	BASIC FILING FEE UTILITY	$ 365.00
24-May-95	08449263	SMALL	BASIC FILING FEE UTILITY	$ 365.00
24-May-95	08449281	SMALL	BASIC FILING FEE UTILITY	$ 365.00
24-May-95	08449291	SMALL	BASIC FILING FEE UTILITY	$ 365.00
24-May-95	08449302	SMALL	BASIC FILING FEE UTILITY	$ 365.00
24-May-95	08449369	SMALL	BASIC FILING FEE UTILITY	$ 365.00
24-May-95	08449411	SMALL	BASIC FILING FEE UTILITY	$ 365.00
24-May-95	08449413	SMALL	BASIC FILING FEE UTILITY	$ 365.00
24-May-95	08449523	SMALL	BASIC FILING FEE UTILITY	$ 365.00
24-May-95	08449530	SMALL	BASIC FILING FEE UTILITY	$ 365.00
24-May-95	08449530	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
24-May-95	08449530	LARGE	BASIC FILING FEE UTILITY	$ 365.00
24-May-95	08449531	SMALL	BASIC FILING FEE UTILITY	$ 365.00
24-May-95	08449532	SMALL	BASIC FILING FEE UTILITY	$ 365.00

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DATE	SERIAL#	ENTITY	TRANSACTION AS OF JULY 15, 2000	FEE
24-May-95	08449652	SMALL	BASIC FILING FEE UTILITY	$ 365.00
24-May-95	08449697	SMALL	BASIC FILING FEE UTILITY	$ 365.00
24-May-95	08449702	SMALL	BASIC FILING FEE UTILITY	$ 365.00
24-May-95	08449717	SMALL	BASIC FILING FEE UTILITY	$ 365.00
24-May-95	08449718	SMALL	BASIC FILING FEE UTILITY	$ 365.00
24-May-95	08449798	SMALL	BASIC FILING FEE UTILITY	$ 365.00
24-May-95	08449800	SMALL	BASIC FILING FEE UTILITY	$ 365.00
24-May-95	08449829	SMALL	BASIC FILING FEE UTILITY	$ 365.00
24-May-95	08449867	SMALL	BASIC FILING FEE UTILITY	$ 365.00
24-May-95	08450680	SMALL	BASIC FILING FEE UTILITY	$ 365.00
24-May-95	08451377	LARGE	BASIC FILING FEE UTILITY	$ 124.00
26-May-95	08437937	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
26-May-95	08437937	LARGE	BASIC FILING FEE UTILITY	$ 365.00
26-May-95	08438659	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
26-May-95	08438659	LARGE	BASIC FILING FEE UTILITY	$ 365.00
26-May-95	08447447	SMALL	BASIC FILING FEE UTILITY	$ 365.00
26-May-95	08447448	SMALL	BASIC FILING FEE UTILITY	$ 365.00
26-May-95	08447449	SMALL	BASIC FILING FEE UTILITY	$ 365.00
26-May-95	08448143	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
26-May-95	08448143	LARGE	BASIC FILING FEE UTILITY	$ 365.00
26-May-95	08451203	SMALL	BASIC FILING FEE UTILITY	$ 573.00
26-May-95	08451377	SMALL	BASIC FILING FEE UTILITY	$ 606.00
26-May-95	08451496	SMALL	BASIC FILING FEE UTILITY	$ 365.00
26-May-95	08451746	LARGE	BASIC FILING FEE UTILITY	$ 869.00
26-May-95	08452395	SMALL	BASIC FILING FEE UTILITY	$ 365.00
30-May-95	08441821	SMALL	BASIC FILING FEE UTILITY	$ 365.00
31-May-95	08448662	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
31-May-95	08448662	LARGE	BASIC FILING FEE UTILITY	$ 365.00
31-May-95	08448667	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
31-May-95	08448667	LARGE	BASIC FILING FEE UTILITY	$ 365.00
01-Jun-95	08445054	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
01-Jun-95	08445054	LARGE	BASIC FILING FEE UTILITY	$ 365.00
01-Jun-95	08445054	LARGE	BASIC FILING FEE UTILITY	$ 365.00
01-Jun-95	08447380	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
01-Jun-95	08447380	LARGE	BASIC FILING FEE UTILITY	$ 365.00
01-Jun-95	08447496	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
01-Jun-95	08447496	LARGE	BASIC FILING FEE UTILITY	$ 365.00
01-Jun-95	08447496	LARGE	BASIC FILING FEE UTILITY	$ 365.00

DATE	SERIAL#	ENTITY	TRANSACTION AS OF JULY 15, 2000	FEE
01-Jun-95	08447502	LARGE	BASIC FILING FEE UTILITY	$ 365.00
01-Jun-95	08447908	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
01-Jun-95	08447908	LARGE	BASIC FILING FEE UTILITY	$ 365.00
01-Jun-95	08447908	LARGE	BASIC FILING FEE UTILITY	$ 365.00
01-Jun-95	08447938	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
01-Jun-95	08447938	LARGE	BASIC FILING FEE UTILITY	$ 365.00
01-Jun-95	08447938	LARGE	BASIC FILING FEE UTILITY	$ 365.00
01-Jun-95	08448175	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
01-Jun-95	08448175	LARGE	BASIC FILING FEE UTILITY	$ 365.00
01-Jun-95	08448175	LARGE	BASIC FILING FEE UTILITY	$ 365.00
01-Jun-95	08448833	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
01-Jun-95	08448833	LARGE	BASIC FILING FEE UTILITY	$ 365.00
01-Jun-95	08448979	LARGE	BASIC FILING FEE UTILITY	$ 365.00
01-Jun-95	08449800	LARGE	BASIC FILING FEE UTILITY	$ 730.00
01-Jun-95	08449800	LARGE	BASIC FILING FEE UTILITY	$ (730.00)
01-Jun-95	08449800	LARGE	BASIC FILING FEE UTILITY	$ 365.00
01-Jun-95	08449829	LARGE	BASIC FILING FEE UTILITY	$ 365.00
02-Jun-95	08437864	LARGE	BASIC FILING FEE UTILITY	$ 365.00
02-Jun-95	08447502	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
02-Jun-95	08447502	LARGE	BASIC FILING FEE UTILITY	$ 365.00
02-Jun-95	08448794	SMALL	BASIC FILING FEE UTILITY	$ (479.00)
02-Jun-95	08448794	LARGE	BASIC FILING FEE UTILITY	$ 479.00
02-Jun-95	08458566	LARGE	BASIC FILING FEE UTILITY	$ 365.00
02-Jun-95	08458699	LARGE	BASIC FILING FEE UTILITY	$ 365.00
02-Jun-95	08458760	SMALL	BASIC FILING FEE UTILITY	$ 365.00
02-Jun-95	08459216	SMALL	BASIC FILING FEE UTILITY	$ 365.00
02-Jun-95	08459217	SMALL	BASIC FILING FEE UTILITY	$ 365.00
02-Jun-95	08459218	LARGE	BASIC FILING FEE UTILITY	$ 365.00
02-Jun-95	08459788	SMALL	BASIC FILING FEE UTILITY	$ 365.00
02-Jun-95	08459788	LARGE	BASIC FILING FEE UTILITY	$ 730.00
02-Jun-95	08459788	NOT APPLICABLE	RECORDING EACH PATENT ASSIGNMENT, AGREEMENT, OR OTHER PAPER, PER PROPERTY	$ 40.00
02-Jun-95	08459788	LARGE	BASIC FILING FEE UTILITY	$ (730.00)
02-Jun-95	08460043	LARGE	BASIC FILING FEE UTILITY	$ 365.00
02-Jun-95	08460081	LARGE	BASIC FILING FEE UTILITY	$ 365.00
02-Jun-95	08460085	SMALL	BASIC FILING FEE UTILITY	$ 365.00
02-Jun-95	08460120	LARGE	BASIC FILING FEE UTILITY	$ 365.00
02-Jun-95	08460187	LARGE	BASIC FILING FEE UTILITY	$ 365.00
02-Jun-95	08460240	LARGE	BASIC FILING FEE UTILITY	$ 365.00

DATE	SERIAL#	ENTITY	TRANSACTION AS OF JULY 15, 2000	FEE
02-Jun-95	08460256	LARGE	BASIC FILING FEE UTILITY	$ 365.00
02-Jun-95	08460274	LARGE	BASIC FILING FEE UTILITY	$ 365.00
02-Jun-95	08460387	SMALL	BASIC FILING FEE UTILITY	$ 365.00
02-Jun-95	08460394	SMALL	BASIC FILING FEE UTILITY	$ 365.00
02-Jun-95	08460401	SMALL	BASIC FILING FEE UTILITY	$ 365.00
02-Jun-95	08460556	LARGE	BASIC FILING FEE UTILITY	$ 365.00
02-Jun-95	08460557	LARGE	BASIC FILING FEE UTILITY	$ 365.00
02-Jun-95	08460591	SMALL	BASIC FILING FEE UTILITY	$ 365.00
02-Jun-95	08460591	LARGE	BASIC FILING FEE UTILITY	$ 365.00
02-Jun-95	08460592	SMALL	BASIC FILING FEE UTILITY	$ 365.00
02-Jun-95	08460634	SMALL	BASIC FILING FEE UTILITY	$ 365.00
02-Jun-95	08460642	SMALL	BASIC FILING FEE UTILITY	$ 365.00
02-Jun-95	08460668	LARGE	BASIC FILING FEE UTILITY	$ 365.00
02-Jun-95	08460677	LARGE	BASIC FILING FEE UTILITY	$ 365.00
02-Jun-95	08460711	LARGE	BASIC FILING FEE UTILITY	$ 365.00
02-Jun-95	08460713	LARGE	BASIC FILING FEE UTILITY	$ 365.00
02-Jun-95	08460743	LARGE	BASIC FILING FEE UTILITY	$ 365.00
02-Jun-95	08460765	SMALL	BASIC FILING FEE UTILITY	$ 365.00
02-Jun-95	08460766	SMALL	BASIC FILING FEE UTILITY	$ 365.00
02-Jun-95	08460770	LARGE	BASIC FILING FEE UTILITY	$ 365.00
02-Jun-95	08460793	LARGE	BASIC FILING FEE UTILITY	$ 365.00
05-Jun-95	08437887	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
05-Jun-95	08437887	LARGE	BASIC FILING FEE UTILITY	$ 365.00
05-Jun-95	08438011	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
05-Jun-95	08438011	LARGE	BASIC FILING FEE UTILITY	$ 365.00
05-Jun-95	08446123	SMALL	BASIC FILING FEE UTILITY	$ 365.00
05-Jun-95	08446124	SMALL	BASIC FILING FEE UTILITY	$ 365.00
05-Jun-95	08448810	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
05-Jun-95	08448810	LARGE	BASIC FILING FEE UTILITY	$ 365.00
05-Jun-95	08448917	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
05-Jun-95	08448917	LARGE	BASIC FILING FEE UTILITY	$ 365.00
05-Jun-95	08449097	LARGE	BASIC FILING FEE UTILITY	$ 365.00
05-Jun-95	08449702	LARGE	BASIC FILING FEE UTILITY	$ 365.00
05-Jun-95	08449702	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
05-Jun-95	08449702	LARGE	BASIC FILING FEE UTILITY	$ 365.00
05-Jun-95	08449800	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
05-Jun-95	08449800	LARGE	BASIC FILING FEE UTILITY	$ 365.00
05-Jun-95	08449829	SMALL	BASIC FILING FEE UTILITY	$ (365.00)

DATE	SERIAL#	ENTITY	TRANSACTION AS OF JULY 15, 2000	FEE
05-Jun-95	08449829	LARGE	BASIC FILING FEE UTILITY	$ 365.00
05-Jun-95	08452395	LARGE	BASIC FILING FEE UTILITY	$ 365.00
05-Jun-95	08452395	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
05-Jun-95	08452395	LARGE	BASIC FILING FEE UTILITY	$ 365.00
05-Jun-95	08459521	SMALL	BASIC FILING FEE UTILITY	$ 365.00
05-Jun-95	08459522	LARGE	BASIC FILING FEE UTILITY	$ 365.00
05-Jun-95	08460817	SMALL	BASIC FILING FEE UTILITY	$ 365.00
05-Jun-95	08470476	LARGE	BASIC FILING FEE UTILITY	$ 365.00
06-Jun-95	08447679	SMALL	BASIC FILING FEE UTILITY	$ 365.00
06-Jun-95	08449530	LARGE	BASIC FILING FEE UTILITY	$ 365.00
06-Jun-95	08459788	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
06-Jun-95	08459788	LARGE	BASIC FILING FEE UTILITY	$ 365.00
06-Jun-95	08466888	LARGE	BASIC FILING FEE UTILITY	$ 365.00
06-Jun-95	08466888	LARGE	BASIC FILING FEE UTILITY	$ (365.00)
06-Jun-95	08466888	LARGE	BASIC FILING FEE UTILITY	$ 365.00
06-Jun-95	08466890	LARGE	BASIC FILING FEE UTILITY	$ 365.00
06-Jun-95	08466894	LARGE	BASIC FILING FEE UTILITY	$ 365.00
06-Jun-95	08467045	LARGE	BASIC FILING FEE UTILITY	$ 365.00
06-Jun-95	08467904	LARGE	BASIC FILING FEE UTILITY	$ 365.00
06-Jun-95	08468044	SMALL	BASIC FILING FEE UTILITY	$ 365.00
06-Jun-95	08468323	LARGE	BASIC FILING FEE UTILITY	$ 365.00
06-Jun-95	08468324	LARGE	BASIC FILING FEE UTILITY	$ 365.00
06-Jun-95	08468641	SMALL	BASIC FILING FEE UTILITY	$ 365.00
06-Jun-95	08468994	LARGE	BASIC FILING FEE UTILITY	$ 365.00
06-Jun-95	08469103	LARGE	BASIC FILING FEE UTILITY	$ 365.00
06-Jun-95	08469106	LARGE	BASIC FILING FEE UTILITY	$ 365.00
06-Jun-95	08469107	LARGE	BASIC FILING FEE UTILITY	$ 365.00
06-Jun-95	08469108	LARGE	BASIC FILING FEE UTILITY	$ 365.00
06-Jun-95	08469109	LARGE	BASIC FILING FEE UTILITY	$ 365.00
06-Jun-95	08469355	SMALL	BASIC FILING FEE UTILITY	$ 365.00
06-Jun-95	08469496	LARGE	BASIC FILING FEE UTILITY	$ 365.00
06-Jun-95	08469517	SMALL	BASIC FILING FEE UTILITY	$ 365.00
06-Jun-95	08469623	LARGE	BASIC FILING FEE UTILITY	$ 365.00
06-Jun-95	08469624	LARGE	BASIC FILING FEE UTILITY	$ 365.00
06-Jun-95	08469626	LARGE	BASIC FILING FEE UTILITY	$ 365.00
06-Jun-95	08470051	LARGE	BASIC FILING FEE UTILITY	$ 365.00
06-Jun-95	08470052	LARGE	BASIC FILING FEE UTILITY	$ 365.00
06-Jun-95	08470053	LARGE	BASIC FILING FEE UTILITY	$ 365.00

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DATE	SERIAL#	ENTITY	TRANSACTION AS OF JULY 15, 2000	FEE
06-Jun-95	08470054	LARGE	BASIC FILING FEE UTILITY	$ 365.00
06-Jun-95	08470236	LARGE	BASIC FILING FEE UTILITY	$ 365.00
06-Jun-95	08470447	SMALL	BASIC FILING FEE UTILITY	$ 365.00
06-Jun-95	08470448	LARGE	BASIC FILING FEE UTILITY	$ 365.00
06-Jun-95	08470570	LARGE	BASIC FILING FEE UTILITY	$ 365.00
06-Jun-95	08470571	LARGE	BASIC FILING FEE UTILITY	$ 365.00
06-Jun-95	08471024	SMALL	BASIC FILING FEE UTILITY	$ 365.00
06-Jun-95	08471238	SMALL	BASIC FILING FEE UTILITY	$ 365.00
06-Jun-95	08471239	SMALL	BASIC FILING FEE UTILITY	$ 365.00
06-Jun-95	08471240	SMALL	BASIC FILING FEE UTILITY	$ 365.00
06-Jun-95	08472066	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08446124	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
07-Jun-95	08446124	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08447416	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
07-Jun-95	08447416	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08447711	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08447712	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08448251	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08448667	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08448916	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
07-Jun-95	08448916	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08449281	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
07-Jun-95	08449281	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08449291	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
07-Jun-95	08449291	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08449351	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08451377	SMALL	BASIC FILING FEE UTILITY	$ (606.00)
07-Jun-95	08451377	LARGE	BASIC FILING FEE UTILITY	$ 606.00
07-Jun-95	08458566	LARGE	BASIC FILING FEE UTILITY	$ (365.00)
07-Jun-95	08458566	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08458566	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
07-Jun-95	08458566	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08460387	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
07-Jun-95	08460387	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08460401	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
07-Jun-95	08460401	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08460591	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
07-Jun-95	08460591	LARGE	BASIC FILING FEE UTILITY	$ 365.00

TRANSACTION AS OF JULY 15, 2000

DATE	SERIAL#	ENTITY	TRANSACTION	FEE
07-Jun-95	08460592	LARGE	BASIC FILING FEE UTILITY	$ 369.00
07-Jun-95	08460592	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
07-Jun-95	08460592	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08460642	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
07-Jun-95	08460642	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08467045	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08468736	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08470051	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08471191	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08472399	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08472462	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08473213	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08473213	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08473224	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08473224	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08473484	LARGE	BASIC FILING FEE UTILITY	$ 665.00
07-Jun-95	08473484	LARGE	BASIC FILING FEE UTILITY	$ 65.00
07-Jun-95	08473927	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08473927	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08473996	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08473997	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08473998	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08473999	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08474119	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08474145	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08474146	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08474147	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08474496	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08474963	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08474964	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08475341	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08475341	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
07-Jun-95	08475341	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08475342	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08477547	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08477564	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08477570	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08477805	SMALL	BASIC FILING FEE UTILITY	$ 365.00

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DATE	SERIAL#	ENTITY	TRANSACTION AS OF JULY 15, 2000	FEE
07-Jun-95	08477955	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08478044	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08478544	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08478794	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08478858	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08478864	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08478908	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08479042	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08479042	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08479215	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08479216	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08479217	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08479414	SMALL	MULTIPLE DEPENDENT CLAIMS	$ 365.00
07-Jun-95	08479414	SMALL	MULTIPLE DEPENDENT CLAIMS	$ (365.00)
07-Jun-95	08479414	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08479523	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08479524	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08479667	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08480059	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08480060	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08480383	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08480383	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08480383	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
07-Jun-95	08480392	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08480740	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08481074	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08482573	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08482574	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08482857	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08483054	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08483169	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08483169	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08483174	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08483174	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08483269	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08484275	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08484275	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08484276	SMALL	BASIC FILING FEE UTILITY	$ 365.00

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DATE	SERIAL#	ENTITY	TRANSACTION AS OF JULY 15, 2000	FEE
07-Jun-95	08484858	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08484865	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08485282	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08485283	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08485773	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08486258	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08486258	SMALL	BASIC FILING FEE UTILITY	$ -
07-Jun-95	08486259	LARGE	BASIC FILING FEE UTILITY	$ 847.00
07-Jun-95	08486265	SMALL	BASIC FILING FEE UTILITY	$ 403.00
07-Jun-95	08486266	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08486297	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08487155	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08487155	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08487397	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08487408	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08487410	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08487411	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08487428	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08487506	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08487516	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08487526	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08487536	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08487546	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08487556	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08487565	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08487649	SMALL	BASIC FILING FEE UTILITY	$ 479.00
07-Jun-95	08487851	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08487895	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08487895	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08487980	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08487981	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08487982	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08487984	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08488032	SMALL	BASIC FILING FEE UTILITY	$ 981.00
07-Jun-95	08488058	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08488378	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08488383	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08488383	SMALL	BASIC FILING FEE UTILITY	$ (365.00)

DATE	SERIAL#	ENTITY	TRANSACTION AS OF JULY 15, 2000	FEE
07-Jun-95	08488383	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08488383	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08488383	LARGE	BASIC FILING FEE UTILITY	$ (365.00)
07-Jun-95	08488383	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08488436	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08488438	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08488439	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08488619	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08488620	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jun-95	08498002	SMALL	BASIC FILING FEE UTILITY	$ 365.00
08-Jun-95	08448662	SMALL	BASIC FILING FEE UTILITY	$ 365.00
08-Jun-95	08448976	SMALL	BASIC FILING FEE UTILITY	$ 365.00
08-Jun-95	08468044	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
08-Jun-95	08468044	LARGE	BASIC FILING FEE UTILITY	$ 365.00
08-Jun-95	08479374	SMALL	BASIC FILING FEE UTILITY	$ 365.00
08-Jun-95	08479375	SMALL	BASIC FILING FEE UTILITY	$ 365.00
10-Jun-95	08438659	LARGE	BASIC FILING FEE UTILITY	$ 365.00
12-Jun-95	08056501	LARGE	UTILITY ISSUE FEE	$ 40.00
13-Jun-95	08437864	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
13-Jun-95	08437864	LARGE	BASIC FILING FEE UTILITY	$ 365.00
13-Jun-95	08441027	LARGE	BASIC FILING FEE UTILITY	$ (512.00)
13-Jun-95	08441027	SMALL	BASIC FILING FEE UTILITY	$ 512.00
13-Jun-95	08446124	LARGE	BASIC FILING FEE UTILITY	$ 365.00
14-Jun-95	08435757	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
14-Jun-95	08435757	LARGE	BASIC FILING FEE UTILITY	$ 365.00
14-Jun-95	08435757	LARGE	BASIC FILING FEE UTILITY	$ 365.00
14-Jun-95	08435758	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
14-Jun-95	08435758	LARGE	BASIC FILING FEE UTILITY	$ 365.00
14-Jun-95	08435758	LARGE	BASIC FILING FEE UTILITY	$ 365.00
14-Jun-95	08449351	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
14-Jun-95	08449351	LARGE	BASIC FILING FEE UTILITY	$ 365.00
15-Jun-95	08446430	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
15-Jun-95	08446430	LARGE	BASIC FILING FEE UTILITY	$ 365.00
15-Jun-95	08485507	SMALL	BASIC FILING FEE UTILITY	$ 365.00
16-Jun-95	08458699	LARGE	BASIC FILING FEE UTILITY	$ 365.00
16-Jun-95	08459216	LARGE	BASIC FILING FEE UTILITY	$ 365.00
16-Jun-95	08459218	LARGE	BASIC FILING FEE UTILITY	$ 365.00
16-Jun-95	08480740	SMALL	BASIC FILING FEE UTILITY	$ (365.00)

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DATE	SERIAL#	ENTITY	TRANSACTION AS OF JULY 15, 2000	FEE
16-Jun-95	08480740	LARGE	BASIC FILING FEE UTILITY	$ 365.00
17-Jun-95	08442165	LARGE	BASIC FILING FEE UTILITY	$ (566.00)
17-Jun-95	08442165	SMALL	BASIC FILING FEE UTILITY	$ 566.00
17-Jun-95	08459506	SMALL	BASIC FILING FEE UTILITY	$ 365.00
17-Jun-95	08459507	SMALL	BASIC FILING FEE UTILITY	$ 365.00
17-Jun-95	08483054	SMALL	BASIC FILING FEE UTILITY	$ 365.00
17-Jun-95	08483980	SMALL	BASIC FILING FEE UTILITY	$ 365.00
19-Jun-95	08459522	LARGE	BASIC FILING FEE UTILITY	$ 365.00
20-Jun-95	08477955	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
20-Jun-95	08477955	LARGE	BASIC FILING FEE UTILITY	$ 365.00
20-Jun-95	08484276	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
20-Jun-95	08484276	LARGE	BASIC FILING FEE UTILITY	$ 365.00
20-Jun-95	08487851	SMALL	BASIC FILING FEE UTILITY	$ (479.00)
20-Jun-95	08487851	LARGE	BASIC FILING FEE UTILITY	$ 479.00
20-Jun-95	08488620	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
20-Jun-95	08488620	LARGE	BASIC FILING FEE UTILITY	$ 365.00
21-Jun-95	08437887	LARGE	BASIC FILING FEE UTILITY	$ 365.00
21-Jun-95	08438011	LARGE	BASIC FILING FEE UTILITY	$ 365.00
21-Jun-95	08449097	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
21-Jun-95	08449097	LARGE	BASIC FILING FEE UTILITY	$ 365.00
21-Jun-95	08459521	LARGE	BASIC FILING FEE UTILITY	$ 365.00
21-Jun-95	08483169	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
21-Jun-95	08483169	LARGE	BASIC FILING FEE UTILITY	$ 365.00
21-Jun-95	08483174	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
21-Jun-95	08483174	LARGE	BASIC FILING FEE UTILITY	$ 365.00
21-Jun-95	08484275	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
21-Jun-95	08484275	LARGE	BASIC FILING FEE UTILITY	$ 365.00
21-Jun-95	08487895	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
21-Jun-95	08487895	LARGE	BASIC FILING FEE UTILITY	$ 365.00
22-Jun-95	08449110	SMALL	BASIC FILING FEE UTILITY	$ (403.00)
22-Jun-95	08449110	SMALL	BASIC FILING FEE UTILITY	$ 403.00
22-Jun-95	08449110	SMALL	BASIC FILING FEE UTILITY	$ (403.00)
22-Jun-95	08449110	LARGE	BASIC FILING FEE UTILITY	$ 403.00
22-Jun-95	08449717	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
22-Jun-95	08449717	LARGE	BASIC FILING FEE UTILITY	$ 365.00
22-Jun-95	08468044	LARGE	BASIC FILING FEE UTILITY	$ 365.00
23-Jun-95	08447712	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
23-Jun-95	08447712	LARGE	BASIC FILING FEE UTILITY	$ 365.00

DATE	SERIAL#	ENTITY	TRANSACTION AS OF JULY 15, 2000	FEE
23-Jun-95	08448643	SMALL	BASIC FILING FEE UTILITY	$ 365.00
23-Jun-95	08448643	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
23-Jun-95	08448643	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
23-Jun-95	08448643	LARGE	BASIC FILING FEE UTILITY	$ 365.00
23-Jun-95	08459507	LARGE	BASIC FILING FEE UTILITY	$ 365.00
23-Jun-95	08470447	SMALL	BASIC FILING FEE UTILITY	$ 365.00
23-Jun-95	08470447	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
23-Jun-95	08470447	LARGE	BASIC FILING FEE UTILITY	$ 365.00
23-Jun-95	08470447	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
23-Jun-95	08487546	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
23-Jun-95	08487546	LARGE	BASIC FILING FEE UTILITY	$ 365.00
26-Jun-95	08446430	LARGE	BASIC FILING FEE UTILITY	$ 365.00
26-Jun-95	08459217	LARGE	BASIC FILING FEE UTILITY	$ 365.00
28-Jun-95	08469612	LARGE	BASIC FILING FEE UTILITY	$ 365.00
26-Jun-95	08471191	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
26-Jun-95	08471191	LARGE	BASIC FILING FEE UTILITY	$ 365.00
26-Jun-95	08487546	LARGE	BASIC FILING FEE UTILITY	$ 365.00
27-Jun-95	08484865	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
27-Jun-95	08484865	LARGE	BASIC FILING FEE UTILITY	$ 365.00
27-Jun-95	08485282	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
27-Jun-95	08485282	LARGE	BASIC FILING FEE UTILITY	$ 365.00
27-Jun-95	08485283	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
27-Jun-95	08485283	LARGE	BASIC FILING FEE UTILITY	$ 365.00
27-Jun-95	08487506	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
27-Jun-95	08487506	LARGE	BASIC FILING FEE UTILITY	$ 365.00
27-Jun-95	08487526	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
27-Jun-95	08487526	LARGE	BASIC FILING FEE UTILITY	$ 365.00
27-Jun-95	08487556	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
27-Jun-95	08487556	LARGE	BASIC FILING FEE UTILITY	$ 365.00
28-Jun-95	08470476	LARGE	BASIC FILING FEE UTILITY	$ (365.00)
28-Jun-95	08470476	SMALL	BASIC FILING FEE UTILITY	$ 365.00
28-Jun-95	08472980	SMALL	BASIC FILING FEE UTILITY	$ 365.00
29-Jun-95	08447448	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
29-Jun-95	08447448	LARGE	BASIC FILING FEE UTILITY	$ 365.00
29-Jun-95	08449901	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
29-Jun-95	08449901	LARGE	BASIC FILING FEE UTILITY	$ 365.00
29-Jun-95	08471239	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
29-Jun-95	08471239	LARGE	BASIC FILING FEE UTILITY	$ 365.00

DATE	SERIAL#	ENTITY	TRANSACTION AS OF JULY 15, 2000	FEE
30-Jun-95	08440657	LARGE	BASIC FILING FEE UTILITY	$ (376.00)
30-Jun-95	08440657	SMALL	BASIC FILING FEE UTILITY	$ 376.00
05-Jul-95	08469056	LARGE	BASIC FILING FEE UTILITY	$ 365.00
05-Jul-95	08469059	LARGE	BASIC FILING FEE UTILITY	$ 365.00
05-Jul-95	08469078	LARGE	BASIC FILING FEE UTILITY	$ 365.00
05-Jul-95	08479375	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
05-Jul-95	08479375	LARGE	BASIC FILING FEE UTILITY	$ 365.00
06-Jul-95	08113329	LARGE	BASIC FILING FEE UTILITY	$ 365.00
06-Jul-95	08466887	LARGE	BASIC FILING FEE UTILITY	$ 365.00
06-Jul-95	08473996	LARGE	BASIC FILING FEE UTILITY	$ 365.00
06-Jul-95	08474139	SMALL	BASIC FILING FEE UTILITY	$ 555.00
06-Jul-95	08474496	LARGE	BASIC FILING FEE UTILITY	$ 365.00
06-Jul-95	08474674	LARGE	BASIC FILING FEE UTILITY	$ 365.00
06-Jul-95	08477711	SMALL	BASIC FILING FEE UTILITY	$ 365.00
06-Jul-95	08477712	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jul-95	08470448	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Jul-95	08470571	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Jul-95	08471238	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
07-Jul-95	08471238	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Jul-95	08478107	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Jul-95	08478663	SMALL	BASIC FILING FEE UTILITY	$ 365.00
11-Jul-95	08438216	LARGE	BASIC FILING FEE UTILITY	$ 365.00
11-Jul-95	08460401	LARGE	BASIC FILING FEE UTILITY	$ 365.00
11-Jul-95	08477660	SMALL	BASIC FILING FEE UTILITY	$ 725.00
11-Jul-95	08478767	SMALL	BASIC FILING FEE UTILITY	$ 365.00
12-Jul-95	08458760	LARGE	BASIC FILING FEE UTILITY	$ 365.00
12-Jul-95	08460085	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
12-Jul-95	08460085	LARGE	BASIC FILING FEE UTILITY	$ 365.00
13-Jul-95	08469109	LARGE	BASIC FILING FEE UTILITY	$ 365.00
13-Jul-95	08470570	LARGE	BASIC FILING FEE UTILITY	$ 365.00
13-Jul-95	08474674	LARGE	BASIC FILING FEE UTILITY	$ 365.00
14-Jul-95	08474146	LARGE	BASIC FILING FEE UTILITY	$ 365.00
17-Jul-95	08446429	LARGE	BASIC FILING FEE UTILITY	$ 365.00
18-Jul-95	08459507	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
18-Jul-95	08459507	LARGE	BASIC FILING FEE UTILITY	$ 365.00
19-Jul-95	08446429	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
19-Jul-95	08446429	LARGE	BASIC FILING FEE UTILITY	$ 365.00
19-Jul-95	08473213	SMALL	BASIC FILING FEE UTILITY	$ (365.00)

DATE	SERIAL#	ENTITY	TRANSACTION AS OF JULY 15, 2000	FEE
19-Jul-95	08473213	LARGE	BASIC FILING FEE UTILITY	$ 365.00
19-Jul-95	08473927	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
19-Jul-95	08473927	LARGE	BASIC FILING FEE UTILITY	$ 365.00
19-Jul-95	08479042	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
19-Jul-95	08479042	LARGE	BASIC FILING FEE UTILITY	$ 365.00
19-Jul-95	08488383	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
19-Jul-95	08488383	LARGE	BASIC FILING FEE UTILITY	$ 365.00
20-Jul-95	08471239	LARGE	BASIC FILING FEE UTILITY	$ 365.00
21-Jul-95	08471191	LARGE	BASIC FILING FEE UTILITY	$ 365.00
21-Jul-95	08474146	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
21-Jul-95	08474146	LARGE	BASIC FILING FEE UTILITY	$ 365.00
24-Jul-95	08459521	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
24-Jul-95	08459521	LARGE	BASIC FILING FEE UTILITY	$ 365.00
24-Jul-95	08473224	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
24-Jul-95	08473224	LARGE	BASIC FILING FEE UTILITY	$ 365.00
24-Jul-95	08474964	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
24-Jul-95	08474964	LARGE	BASIC FILING FEE UTILITY	$ 365.00
24-Jul-95	08478044	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
24-Jul-95	08478044	LARGE	BASIC FILING FEE UTILITY	$ 365.00
24-Jul-95	08478663	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
24-Jul-95	08478663	LARGE	BASIC FILING FEE UTILITY	$ 365.00
24-Jul-95	08485775	SMALL	BASIC FILING FEE UTILITY	$ 365.00
25-Jul-95	08469355	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
25-Jul-95	08469355	LARGE	BASIC FILING FEE UTILITY	$ 365.00
25-Jul-95	08469355	LARGE	BASIC FILING FEE UTILITY	$ 365.00
26-Jul-95	08469496	LARGE	BASIC FILING FEE UTILITY	$ 365.00
26-Jul-95	08477660	LARGE	BASIC FILING FEE UTILITY	$ 5.00
27-Jul-95	08459506	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
27-Jul-95	08459506	LARGE	BASIC FILING FEE UTILITY	$ 365.00
27-Jul-95	08469517	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
27-Jul-95	08469517	LARGE	BASIC FILING FEE UTILITY	$ 365.00
28-Jul-95	08449291	SMALL	BASIC FILING FEE UTILITY	$ 365.00
30-Jul-95	08477547	LARGE	BASIC FILING FEE UTILITY	$ 365.00
30-Jul-95	08487506	LARGE	BASIC FILING FEE UTILITY	$ 365.00
30-Jul-95	08487526	LARGE	BASIC FILING FEE UTILITY	$ 365.00
01-Aug-95	08469078	LARGE	BASIC FILING FEE UTILITY	$ 730.00
01-Aug-95	08469078	LARGE	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 130.00
01-Aug-95	08479374	SMALL	BASIC FILING FEE UTILITY	$ (365.00)

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DATE	SERIAL#	ENTITY	TRANSACTION AS OF JULY 15, 2000	FEE
01-Aug-95	08479374	LARGE	BASIC FILING FEE UTILITY	$ 365.00
01-Aug-95	08480060	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
01-Aug-95	08480060	LARGE	BASIC FILING FEE UTILITY	$ 365.00
01-Aug-95	08487155	LARGE	BASIC FILING FEE UTILITY	$ (365.00)
01-Aug-95	08487155	SMALL	BASIC FILING FEE UTILITY	$ 365.00
02-Aug-95	08477660	SMALL	BASIC FILING FEE UTILITY	$ (725.00)
02-Aug-95	08477660	LARGE	BASIC FILING FEE UTILITY	$ 725.00
02-Aug-95	08478767	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
02-Aug-95	08478767	LARGE	BASIC FILING FEE UTILITY	$ 365.00
03-Aug-95	08460592	LARGE	BASIC FILING FEE UTILITY	$ (365.00)
03-Aug-95	08460592	SMALL	BASIC FILING FEE UTILITY	$ 365.00
04-Aug-95	08447380	SMALL	BASIC FILING FEE UTILITY	$ 365.00
04-Aug-95	08447380	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 65.00
04-Aug-95	08477711	LARGE	BASIC FILING FEE UTILITY	$ 365.00
04-Aug-95	08477711	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
04-Aug-95	08477711	LARGE	BASIC FILING FEE UTILITY	$ 365.00
04-Aug-95	08478767	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Aug-95	08473999	LARGE	BASIC FILING FEE UTILITY	$ 365.00
08-Aug-95	08473997	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
08-Aug-95	08473997	LARGE	BASIC FILING FEE UTILITY	$ 365.00
08-Aug-95	08473999	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
08-Aug-95	08473999	LARGE	BASIC FILING FEE UTILITY	$ 365.00
09-Aug-95	08460765	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
09-Aug-95	08460765	LARGE	BASIC FILING FEE UTILITY	$ 365.00
11-Aug-95	08470476	LARGE	BASIC FILING FEE UTILITY	$ (365.00)
11-Aug-95	08470476	SMALL	BASIC FILING FEE UTILITY	$ 365.00
11-Aug-95	08472980	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
11-Aug-95	08472980	LARGE	BASIC FILING FEE UTILITY	$ 365.00
11-Aug-95	08475342	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
11-Aug-95	08475342	LARGE	BASIC FILING FEE UTILITY	$ 365.00
11-Aug-95	08478107	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
11-Aug-95	08478107	LARGE	BASIC FILING FEE UTILITY	$ 365.00
11-Aug-95	08486258	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
11-Aug-95	08486258	LARGE	BASIC FILING FEE UTILITY	$ 365.00
12-Aug-95	08469108	LARGE	BASIC FILING FEE UTILITY	$ 365.00
12-Aug-95	08480740	LARGE	BASIC FILING FEE UTILITY	$ 365.00
14-Aug-95	08470476	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
14-Aug-95	08470476	LARGE	BASIC FILING FEE UTILITY	$ 365.00

DATE	SERIAL#	ENTITY	TRANSACTION AS OF JULY 15, 2000	FEE
15-Aug-95	08460081	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 65.00
15-Aug-95	08470052	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 65.00
16-Aug-95	08470053	LARGE	BASIC FILING FEE UTILITY	$ 365.00
16-Aug-95	08477570	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
16-Aug-95	08477570	LARGE	BASIC FILING FEE UTILITY	$ 365.00
16-Aug-95	08477570	LARGE	BASIC FILING FEE UTILITY	$ 365.00
16-Aug-95	08478794	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
16-Aug-95	08478794	LARGE	BASIC FILING FEE UTILITY	$ 365.00
16-Aug-95	08478794	LARGE	BASIC FILING FEE UTILITY	$ 365.00
16-Aug-95	08479374	LARGE	BASIC FILING FEE UTILITY	$ 365.00
16-Aug-95	08479375	LARGE	BASIC FILING FEE UTILITY	$ 365.00
16-Aug-95	08480060	LARGE	BASIC FILING FEE UTILITY	$ 365.00
17-Aug-95	08447712	UNKNOWN	UNSPECIFIED OTHER SERVICES, EXCLUDING LABOR	$ (55.00)
17-Aug-95	08447712	SMALL	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ (55.00)
17-Aug-95	08447712	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
17-Aug-95	08447712	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
17-Aug-95	08447712	LARGE	BASIC FILING FEE UTILITY	$ 365.00
17-Aug-95	08449281	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 65.00
17-Aug-95	08480059	SMALL	BASIC FILING FEE UTILITY	$ 365.00
17-Aug-95	08480059	LARGE	BASIC FILING FEE UTILITY	$ 730.00
17-Aug-95	08480059	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
17-Aug-95	08480059	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
17-Aug-95	08486297	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
17-Aug-95	08486297	LARGE	BASIC FILING FEE UTILITY	$ 730.00
21-Aug-95	08446431	SMALL	BASIC FILING FEE UTILITY	$ 365.00
21-Aug-95	08446431	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 65.00
21-Aug-95	08447724	SMALL	BASIC FILING FEE UTILITY	$ 365.00
21-Aug-95	08447724	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 65.00
21-Aug-95	08448667	SMALL	BASIC FILING FEE UTILITY	$ 365.00
21-Aug-95	08449351	SMALL	BASIC FILING FEE UTILITY	$ 365.00
21-Aug-95	08449351	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 65.00
21-Aug-95	08460557	SMALL	BASIC FILING FEE UTILITY	$ 365.00
22-Aug-95	08447448	SMALL	BASIC FILING FEE UTILITY	$ 365.00
22-Aug-95	08448326	SMALL	BASIC FILING FEE UTILITY	$ 365.00
22-Aug-95	08449110	SMALL	BASIC FILING FEE UTILITY	$ 365.00
22-Aug-95	08449901	SMALL	BASIC FILING FEE UTILITY	$ 365.00
22-Aug-95	08460770	SMALL	BASIC FILING FEE UTILITY	$ 365.00
23-Aug-95	08113329	LARGE	BASIC FILING FEE UTILITY	$ (365.00)

DATE	SERIAL#	ENTITY	TRANSACTION AS OF JULY 15, 2000	FEE
23-Aug-95	08441575	NOT APPLICABLE	PETITIONS TO THE COMMISSIONER UNLESS OTHERWISE SPECIFIED	$ 130.00
23-Aug-95	08447447	SMALL	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 55.00
23-Aug-95	08511491	LARGE	BASIC FILING FEE UTILITY	$ 365.00
25-Aug-95	08460592	LARGE	BASIC FILING FEE UTILITY	$ (369.00)
25-Aug-95	08470476	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 65.00
28-Aug-95	08447712	SMALL	BASIC FILING FEE UTILITY	$ 365.00
28-Aug-95	08447712	LARGE	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 130.00
28-Aug-95	08447712	SMALL	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 55.00
28-Aug-95	08447712	UNKNOWN	UNSPECIFIED OTHER SERVICES, EXCLUDING LABOR	$ 55.00
28-Aug-95	08448810	LARGE	BASIC FILING FEE UTILITY	$ (365.00)
28-Aug-95	08448810	SMALL	BASIC FILING FEE UTILITY	$ 365.00
29-Aug-95	08447679	SMALL	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 55.00
29-Aug-95	08447711	SMALL	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 55.00
29-Aug-95	08448643	SMALL	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 55.00
29-Aug-95	08460394	SMALL	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 55.00
29-Aug-95	08466887	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
30-Aug-95	08448099	SMALL	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 55.00
30-Aug-95	08448644	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
30-Aug-95	08448644	LARGE	BASIC FILING FEE UTILITY	$ 365.00
30-Aug-95	08448644	LARGE	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 130.00
30-Aug-95	08448662	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
30-Aug-95	08448662	LARGE	BASIC FILING FEE UTILITY	$ 365.00
30-Aug-95	08448662	LARGE	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 130.00
30-Aug-95	08448915	SMALL	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 55.00
30-Aug-95	08460668	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
30-Aug-95	08460668	LARGE	BASIC FILING FEE UTILITY	$ 365.00
30-Aug-95	08460668	LARGE	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 130.00
30-Aug-95	08488620	LARGE	BASIC FILING FEE UTILITY	$ 365.00
30-Aug-95	08488620	LARGE	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 130.00
31-Aug-95	08448794	NOT APPLICABLE	SUBMISSION OF I.D.S. UNDER RULE 1.97(c)	$ 210.00
31-Aug-95	08487516	LARGE	BASIC FILING FEE UTILITY	$ 365.00
31-Aug-95	08487516	LARGE	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 130.00
01-Sep-95	08474964	LARGE	BASIC FILING FEE UTILITY	$ 365.00
01-Sep-95	08475341	LARGE	CLAIMS IN EXCESS OF 20	$ 365.00
01-Sep-95	08475341	LARGE	CLAIMS IN EXCESS OF 20	$ (365.00)
01-Sep-95	08475341	LARGE	BASIC FILING FEE UTILITY	$ 365.00
01-Sep-95	08478044	LARGE	BASIC FILING FEE UTILITY	$ 365.00
01-Sep-95	08478663	LARGE	BASIC FILING FEE UTILITY	$ 365.00

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DATE	SERIAL#	ENTITY	TRANSACTION AS OF JULY 15, 2000	FEE
01-Sep-95	08482857	LARGE	BASIC FILING FEE UTILITY	$ 365.00
01-Sep-95	08482857	LARGE	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 130.00
01-Sep-95	08483980	NOT APPLICABLE	PETITIONS TO THE COMMISSIONER UNLESS OTHERWISE SPECIFIED	$ 130.00
05-Sep-95	08447449	SMALL	BASIC FILING FEE UTILITY	$ 365.00
05-Sep-95	08447449	NOT APPLICABLE	PETITIONS TO THE COMMISSIONER UNLESS OTHERWISE SPECIFIED	$ 130.00
05-Sep-95	08447449	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 370.00
05-Sep-95	08447529	SMALL	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 55.00
05-Sep-95	08448833	LARGE	BASIC FILING FEE UTILITY	$ 365.00
05-Sep-95	08448833	LARGE	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 130.00
05-Sep-95	08448833	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
05-Sep-95	08448978	LARGE	BASIC FILING FEE UTILITY	$ 365.00
05-Sep-95	08448978	LARGE	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 130.00
05-Sep-95	08448978	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 370.00
05-Sep-95	08449798	LARGE	BASIC FILING FEE UTILITY	$ 365.00
05-Sep-95	08449798	LARGE	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 130.00
05-Sep-95	08459506	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 65.00
05-Sep-95	08460187	SMALL	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 55.00
05-Sep-95	08460187	LARGE	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 130.00
05-Sep-95	08460743	LARGE	BASIC FILING FEE UTILITY	$ 365.00
05-Sep-95	08469056	LARGE	BASIC FILING FEE UTILITY	$ 365.00
05-Sep-95	08469056	LARGE	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 130.00
05-Sep-95	08470236	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 65.00
05-Sep-95	08479042	LARGE	BASIC FILING FEE UTILITY	$ 365.00
05-Sep-95	08479042	LARGE	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 130.00
05-Sep-95	08479042	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
05-Sep-95	08479524	LARGE	BASIC FILING FEE UTILITY	$ 365.00
05-Sep-95	08479524	LARGE	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 130.00
05-Sep-95	08487411	SMALL	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 55.00
05-Sep-95	08487536	LARGE	BASIC FILING FEE UTILITY	$ 365.00
05-Sep-95	08487536	LARGE	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 130.00
05-Sep-95	08487851	LARGE	BASIC FILING FEE UTILITY	$ 251.00
05-Sep-95	08487851	LARGE	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 130.00
05-Sep-95	08487851	LARGE	CLAIMS IN EXCESS OF 20	$ 114.00
06-Sep-95	08397582	NOT APPLICABLE	SUBMISSION OF I.D.S. UNDER RULE 1.97(c)	$ 210.00
06-Sep-95	08447449	SMALL	BASIC FILING FEE UTILITY	$ 365.00
06-Sep-95	08447449	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ (370.00)
06-Sep-95	08460793	LARGE	BASIC FILING FEE UTILITY	$ 365.00
06-Sep-95	08460793	LARGE	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 130.00

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06-Sep-95	08469078	SMALL	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 55.00
06-Sep-95	08471238	LARGE	BASIC FILING FEE UTILITY	$ 730.00
06-Sep-95	08471238	LARGE	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 130.00
06-Sep-95	08473997	LARGE	BASIC FILING FEE UTILITY	$ 365.00
06-Sep-95	08473997	LARGE	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 130.00
06-Sep-95	08482573	LARGE	BASIC FILING FEE UTILITY	$ 365.00
06-Sep-95	08482573	LARGE	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 130.00
07-Sep-95	08446579	SMALL	BASIC FILING FEE UTILITY	$ 114.00
07-Sep-95	08466887	LARGE	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 130.00
07-Sep-95	08466887	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Sep-95	08467904	LARGE	BASIC FILING FEE UTILITY	$ (365.00)
07-Sep-95	08467904	SMALL	BASIC FILING FEE UTILITY	$ 365.00
07-Sep-95	08472980	LARGE	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 130.00
07-Sep-95	08472980	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Sep-95	08473999	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Sep-95	08475342	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Sep-95	08475342	LARGE	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 130.00
07-Sep-95	08475342	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Sep-95	08477660	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Sep-95	08477711	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Sep-95	08478107	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Sep-95	08478107	LARGE	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 130.00
07-Sep-95	08478107	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Sep-95	08478794	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Sep-95	08478858	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Sep-95	08478908	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Sep-95	08479216	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Sep-95	08479374	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Sep-95	08480060	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Sep-95	08480383	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Sep-95	08480383	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Sep-95	08480383	LARGE	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 130.00
07-Sep-95	08486265	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Sep-95	08487410	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Sep-95	08487649	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Sep-95	08487980	LARGE	BASIC FILING FEE UTILITY	$ 365.00
08-Sep-95	08467904	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 65.00
08-Sep-95	08470054	LARGE	BASIC FILING FEE UTILITY	$ 365.00

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08-Sep-95	08470054	LARGE	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 130.00
08-Sep-95	08474119	LARGE	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 130.00
08-Sep-95	08474119	LARGE	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ (130.00)
08-Sep-95	08474119	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 65.00
08-Sep-95	08482574	LARGE	BASIC FILING FEE UTILITY	$ 365.00
08-Sep-95	08482574	LARGE	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 130.00
08-Sep-95	08498002	LARGE	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 130.00
08-Sep-95	08498002	LARGE	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ (130.00)
08-Sep-95	08498002	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 65.00
11-Sep-95	08437044	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 114.00
11-Sep-95	08437819	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 570.00
11-Sep-95	08437819	SMALL	CLAIMS IN EXCESS OF 20	$ 11.00
11-Sep-95	08471238	LARGE	BASIC FILING FEE UTILITY	$ (365.00)
11-Sep-95	08480392	LARGE	BASIC FILING FEE UTILITY	$ 365.00
11-Sep-95	08483269	LARGE	BASIC FILING FEE UTILITY	$ 365.00
11-Sep-95	08487397	LARGE	BASIC FILING FEE UTILITY	$ 365.00
11-Sep-95	08487506	LARGE	BASIC FILING FEE UTILITY	$ 365.00
11-Sep-95	08487984	LARGE	BASIC FILING FEE UTILITY	$ 365.00
11-Sep-95	08488438	NOT APPLICABLE	RECORDING EACH PATENT ASSIGNMENT, AGREEMENT, OR OTHER PAPER, PER PROPERTY	$ 40.00
11-Sep-95	08488438	LARGE	BASIC FILING FEE UTILITY	$ 365.00
12-Sep-95	08448810	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 76.00
12-Sep-95	08448810	LARGE	CLAIMS IN EXCESS OF 20	$ 125.00
12-Sep-95	08460274	LARGE	BASIC FILING FEE UTILITY	$ (365.00)
12-Sep-95	08460274	SMALL	BASIC FILING FEE UTILITY	$ 365.00
12-Sep-95	08469624	LARGE	BASIC FILING FEE UTILITY	$ (365.00)
12-Sep-95	08469624	SMALL	BASIC FILING FEE UTILITY	$ 365.00
12-Sep-95	08480392	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
12-Sep-95	08480392	LARGE	BASIC FILING FEE UTILITY	$ 365.00
12-Sep-95	08482574	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
12-Sep-95	08482574	LARGE	BASIC FILING FEE UTILITY	$ 365.00
12-Sep-95	08485282	LARGE	BASIC FILING FEE UTILITY	$ (365.00)
12-Sep-95	08485282	SMALL	BASIC FILING FEE UTILITY	$ 365.00
12-Sep-95	08487411	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 65.00
14-Sep-95	08466888	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 65.00
14-Sep-95	08477712	SMALL	CLAIMS IN EXCESS OF 20	$ 11.00
14-Sep-95	08477712	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 38.00
15-Sep-95	08448667	LARGE	BASIC FILING FEE UTILITY	$ (365.00)
15-Sep-95	08448667	SMALL	BASIC FILING FEE UTILITY	$ 365.00

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15-Sep-95	08448667	SMALL	BASIC FILING FEE UTILITY	$	(365.00)
15-Sep-95	08448667	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$	65.00
15-Sep-95	08460274	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$	65.00
15-Sep-95	08468324	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$	65.00
15-Sep-95	08469059	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$	65.00
15-Sep-95	08469103	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$	65.00
15-Sep-95	08469624	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$	65.00
15-Sep-95	08481074	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$	38.00
15-Sep-95	08485283	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$	65.00
15-Sep-95	08485283	LARGE	BASIC FILING FEE UTILITY	$	365.00
18-Sep-95	08397582	LARGE	STATUTORY DISCLAIMER	$	110.00
18-Sep-95	08448251	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$	65.00
18-Sep-95	08449351	SMALL	BASIC FILING FEE UTILITY	$	(365.00)
18-Sep-95	08460394	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$	65.00
18-Sep-95	08460642	LARGE	BASIC FILING FEE UTILITY	$	(365.00)
18-Sep-95	08460642	SMALL	BASIC FILING FEE UTILITY	$	365.00
18-Sep-95	08470236	LARGE	BASIC FILING FEE UTILITY	$	(365.00)
18-Sep-95	08470236	SMALL	BASIC FILING FEE UTILITY	$	365.00
19-Sep-95	08460085	SMALL	BASIC FILING FEE UTILITY	$	365.00
19-Sep-95	08460085	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$	65.00
20-Sep-95	08447726	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$	65.00
20-Sep-95	08449110	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$	65.00
20-Sep-95	08460557	LARGE	BASIC FILING FEE UTILITY	$	(365.00)
20-Sep-95	08460557	SMALL	BASIC FILING FEE UTILITY	$	365.00
20-Sep-95	08460557	SMALL	BASIC FILING FEE UTILITY	$	(365.00)
20-Sep-95	08460557	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$	65.00
20-Sep-95	08460766	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$	65.00
21-Sep-95	08448810	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$	65.00
22-Sep-95	08449901	LARGE	BASIC FILING FEE UTILITY	$	(365.00)
22-Sep-95	08449901	SMALL	BASIC FILING FEE UTILITY	$	365.00
22-Sep-95	08449901	SMALL	BASIC FILING FEE UTILITY	$	(365.00)
22-Sep-95	08449901	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$	365.00
22-Sep-95	08484865	LARGE	BASIC FILING FEE UTILITY	$	365.00
25-Sep-95	08460765	LARGE	BASIC FILING FEE UTILITY	$	(365.00)
25-Sep-95	08460765	LARGE	BASIC FILING FEE UTILITY	$	365.00
25-Sep-95	08460765	LARGE	BASIC FILING FEE UTILITY	$	365.00
25-Sep-95	08477955	LARGE	BASIC FILING FEE UTILITY	$	(365.00)
25-Sep-95	08477955	SMALL	BASIC FILING FEE UTILITY	$	365.00

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26-Sep-95	08447447	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 65.00
26-Sep-95	08460642	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 65.00
26-Sep-95	08460713	LARGE	BASIC FILING FEE UTILITY	$ (365.00)
26-Sep-95	08460713	SMALL	BASIC FILING FEE UTILITY	$ 365.00
26-Sep-95	08460713	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 65.00
28-Sep-95	08449291	LARGE	BASIC FILING FEE UTILITY	$ (365.00)
28-Sep-95	08449291	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 65.00
28-Sep-95	08487556	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 65.00
29-Sep-95	08469078	LARGE	BASIC FILING FEE UTILITY	$ (730.00)
29-Sep-95	08469078	LARGE	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ (130.00)
29-Sep-95	08479414	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 65.00
02-Oct-95	08448643	LARGE	BASIC FILING FEE UTILITY	$ (365.00)
02-Oct-95	08448643	SMALL	BASIC FILING FEE UTILITY	$ 365.00
02-Oct-95	08487556	LARGE	BASIC FILING FEE UTILITY	$ (365.00)
02-Oct-95	08487556	SMALL	BASIC FILING FEE UTILITY	$ 365.00
04-Oct-95	08484276	LARGE	BASIC FILING FEE UTILITY	$ (365.00)
04-Oct-95	08484276	SMALL	BASIC FILING FEE UTILITY	$ 365.00
04-Oct-95	08487536	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
04-Oct-95	08487536	LARGE	BASIC FILING FEE UTILITY	$ 365.00
06-Oct-95	08448099	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 65.00
06-Oct-95	08466894	SMALL	BASIC FILING FEE UTILITY	$ 365.00
10-Oct-95	08460085	LARGE	BASIC FILING FEE UTILITY	$ (365.00)
11-Oct-95	08447711	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 65.00
12-Oct-95	08448326	LARGE	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 130.00
13-Oct-95	08448643	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 65.00
13-Oct-95	08469078	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 65.00
13-Oct-95	08485507	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 65.00
17-Oct-95	08469106	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 65.00
20-Oct-95	08447679	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 65.00
20-Oct-95	08471240	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 65.00
23-Oct-95	08437887	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 312.00
23-Oct-95	08446431	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
23-Oct-95	08446431	LARGE	BASIC FILING FEE UTILITY	$ 365.00
23-Oct-95	08446431	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
23-Oct-95	08446431	LARGE	BASIC FILING FEE UTILITY	$ 365.00
23-Oct-95	08474139	SMALL	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 55.00
23-Oct-95	08485282	SMALL	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 190.00
23-Oct-95	08486258	SMALL	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 190.00

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23-Oct-95	08511491	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
23-Oct-95	08511491	LARGE	BASIC FILING FEE UTILITY	$ 385.00
23-Oct-95	08511491	LARGE	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 130.00
27-Oct-95	08397582	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
27-Oct-95	08397582	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 546.00
27-Oct-95	08397582	LARGE	CLAIMS IN EXCESS OF 20	$ 286.00
27-Oct-95	08482573	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
27-Oct-95	08482573	LARGE	BASIC FILING FEE UTILITY	$ 365.00
30-Oct-95	08473997	LARGE	BASIC FILING FEE UTILITY	$ (365.00)
30-Oct-95	08473997	SMALL	BASIC FILING FEE UTILITY	$ 365.00
30-Oct-95	08473997	LARGE	BASIC FILING FEE UTILITY	$ (365.00)
30-Oct-95	08473997	LARGE	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ (130.00)
30-Oct-95	08473997	SMALL	BASIC FILING FEE UTILITY	$ 365.00
30-Oct-95	08473997	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 130.00
30-Oct-95	08477564	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 65.00
30-Oct-95	08485775	SMALL	REISSUE INDEPENDENT CLAIMS OVER ORIGINAL PATENT	$ 38.00
31-Oct-95	08435757	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 624.00
31-Oct-95	08447380	LARGE	BASIC FILING FEE UTILITY	$ (365.00)
31-Oct-95	08447448	LARGE	BASIC FILING FEE UTILITY	$ (365.00)
31-Oct-95	08448915	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 117.00
31-Oct-95	08460770	LARGE	BASIC FILING FEE UTILITY	$ (365.00)
31-Oct-95	08473997	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
31-Oct-95	08473997	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ (65.00)
01-Nov-95	08449901	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ (300.00)
01-Nov-95	08472980	LARGE	BASIC FILING FEE UTILITY	$ (365.00)
01-Nov-95	08472980	LARGE	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ (130.00)
01-Nov-95	08480383	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
02-Nov-95	08459506	LARGE	BASIC FILING FEE UTILITY	$ (365.00)
02-Nov-95	08459506	SMALL	BASIC FILING FEE UTILITY	$ 365.00
02-Nov-95	08460187	LARGE	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ (130.00)
02-Nov-95	08460187	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 65.00
02-Nov-95	08466887	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ (110.00)
02-Nov-95	08466887	LARGE	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ (130.00)
02-Nov-95	08466887	LARGE	BASIC FILING FEE UTILITY	$ (365.00)
03-Nov-95	08440657	LARGE	BASIC FILING FEE UTILITY	$ 396.00
03-Nov-95	08440657	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 390.00
03-Nov-95	08440657	LARGE	CLAIMS IN EXCESS OF 20	$ 484.00
03-Nov-95	08441033	LARGE	BASIC FILING FEE UTILITY	$ 375.00

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03-Nov-95	08441033	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$	78.00
03-Nov-95	08441575	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$	78.00
03-Nov-95	08441575	LARGE	BASIC FILING FEE UTILITY	$	375.00
03-Nov-95	08441575	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$	156.00
03-Nov-95	08441701	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$	312.00
03-Nov-95	08441701	LARGE	CLAIMS IN EXCESS OF 20	$	132.00
03-Nov-95	08441701	LARGE	BASIC FILING FEE UTILITY	$	375.00
03-Nov-95	08441749	LARGE	BASIC FILING FEE UTILITY	$	710.00
03-Nov-95	08441749	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$	702.00
03-Nov-95	08441749	LARGE	CLAIMS IN EXCESS OF 20	$	198.00
03-Nov-95	08446579	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$	156.00
03-Nov-95	08446579	SMALL	CLAIMS IN EXCESS OF 20	$	110.00
03-Nov-95	08448978	SMALL	BASIC FILING FEE UTILITY	$	(365.00)
03-Nov-95	08448978	LARGE	BASIC FILING FEE UTILITY	$	365.00
03-Nov-95	08449263	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$	312.00
03-Nov-95	08449263	SMALL	CLAIMS IN EXCESS OF 20	$	319.00
03-Nov-95	08449263	SMALL	MULTIPLE DEPENDENT CLAIMS	$	125.00
03-Nov-95	08479667	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$	156.00
03-Nov-95	08479667	LARGE	CLAIMS IN EXCESS OF 20	$	110.00
06-Nov-95	08478107	LARGE	BASIC FILING FEE UTILITY	$	(365.00)
07-Nov-95	08440837	LARGE	BASIC FILING FEE UTILITY	$	375.00
07-Nov-95	08440837	LARGE	CLAIMS IN EXCESS OF 20	$	110.00
07-Nov-95	08440837	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$	234.00
07-Nov-95	08441027	LARGE	BASIC FILING FEE UTILITY	$	538.00
07-Nov-95	08441027	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$	156.00
07-Nov-95	08441027	LARGE	CLAIMS IN EXCESS OF 20	$	154.00
07-Nov-95	08441821	LARGE	BASIC FILING FEE UTILITY	$	375.00
07-Nov-95	08441821	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$	468.00
07-Nov-95	08441996	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$	468.00
07-Nov-95	08441996	LARGE	CLAIMS IN EXCESS OF 20	$	44.00
07-Nov-95	08441996	LARGE	BASIC FILING FEE UTILITY	$	556.00
07-Nov-95	08442165	LARGE	BASIC FILING FEE UTILITY	$	576.00
07-Nov-95	08442165	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$	156.00
07-Nov-95	08442165	LARGE	CLAIMS IN EXCESS OF 20	$	176.00
07-Nov-95	08442369	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$	238.00
07-Nov-95	08442369	LARGE	BASIC FILING FEE UTILITY	$	375.00
07-Nov-95	08442369	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$	(238.00)
07-Nov-95	08442369	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$	234.00

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07-Nov-95	08449369	LARGE	BASIC FILING FEE UTILITY	$ 357.00
07-Nov-95	08449369	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
07-Nov-95	08449369	LARGE	BASIC FILING FEE UTILITY	$ (357.00)
07-Nov-95	08449369	LARGE	BASIC FILING FEE UTILITY	$ 375.00
07-Nov-95	08451496	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 312.00
07-Nov-95	08451496	LARGE	BASIC FILING FEE UTILITY	$ 375.00
07-Nov-95	08472399	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 65.00
07-Nov-95	08488439	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 117.00
09-Nov-95	08437045	LARGE	CLAIMS IN EXCESS OF 20	$ 308.00
09-Nov-95	08437045	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 312.00
09-Nov-95	08437629	SMALL	CLAIMS IN EXCESS OF 20	$ 39.00
09-Nov-95	08438659	SMALL	CLAIMS IN EXCESS OF 20	$ 165.00
09-Nov-95	08438659	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 195.00
09-Nov-95	08439670	LARGE	CLAIMS IN EXCESS OF 20	$ 176.00
09-Nov-95	08439670	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 468.00
09-Nov-95	08439670	LARGE	BASIC FILING FEE UTILITY	$ 893.00
09-Nov-95	08442327	LARGE	CLAIMS IN EXCESS OF 20	$ 286.00
09-Nov-95	08442327	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 546.00
09-Nov-95	08442327	LARGE	BASIC FILING FEE UTILITY	$ 629.00
09-Nov-95	08442335	LARGE	BASIC FILING FEE UTILITY	$ 665.00
09-Nov-95	08442335	LARGE	CLAIMS IN EXCESS OF 20	$ 132.00
09-Nov-95	08442335	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 156.00
09-Nov-95	08442335	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 546.00
09-Nov-95	08442335	LARGE	BASIC FILING FEE UTILITY	$ 65.00
09-Nov-95	08442505	LARGE	CLAIMS IN EXCESS OF 20	$ 220.00
09-Nov-95	08442505	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 390.00
09-Nov-95	08442505	LARGE	BASIC FILING FEE UTILITY	$ 502.00
09-Nov-95	08448667	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
09-Nov-95	08449411	SMALL	CLAIMS IN EXCESS OF 20	$ 33.00
09-Nov-95	08449411	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
09-Nov-95	08449829	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 234.00
09-Nov-95	08468994	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
09-Nov-95	08470052	SMALL	CLAIMS IN EXCESS OF 20	$ 55.00
09-Nov-95	08470052	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
09-Nov-95	08470476	SMALL	CLAIMS IN EXCESS OF 20	$ 44.00
09-Nov-95	08470476	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
09-Nov-95	08474139	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 234.00
09-Nov-95	08479042	LARGE	CLAIMS IN EXCESS OF 20	$ 264.00

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09-Nov-95	08479042	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 468.00
09-Nov-95	08480740	SMALL	CLAIMS IN EXCESS OF 20	$ 22.00
09-Nov-95	08480740	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
09-Nov-95	08481074	SMALL	CLAIMS IN EXCESS OF 20	$ 44.00
09-Nov-95	08481074	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 195.00
09-Nov-95	08484275	SMALL	CLAIMS IN EXCESS OF 20	$ 165.00
09-Nov-95	08484275	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 234.00
09-Nov-95	08485283	SMALL	CLAIMS IN EXCESS OF 20	$ 22.00
09-Nov-95	08485283	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 117.00
09-Nov-95	08511491	LARGE	CLAIMS IN EXCESS OF 20	$ 440.00
09-Nov-95	08511491	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 468.00
13-Nov-95	08441577	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 234.00
13-Nov-95	08441577	SMALL	CLAIMS IN EXCESS OF 20	$ 110.00
13-Nov-95	08446430	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 234.00
13-Nov-95	08446430	LARGE	CLAIMS IN EXCESS OF 20	$ 44.00
13-Nov-95	08448116	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 156.00
13-Nov-95	08448116	LARGE	CLAIMS IN EXCESS OF 20	$ 44.00
13-Nov-95	08448116	LARGE	BASIC FILING FEE UTILITY	$ 385.00
13-Nov-95	08472980	LARGE	BASIC FILING FEE UTILITY	$ (365.00)
13-Nov-95	08472980	SMALL	BASIC FILING FEE UTILITY	$ 365.00
13-Nov-95	08483054	SMALL	CLAIMS IN EXCESS OF 20	$ 78.00
15-Nov-95	08474139	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 65.00
16-Nov-95	08448810	SMALL	CLAIMS IN EXCESS OF 20	$ 121.00
16-Nov-95	08448810	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 195.00
16-Nov-95	08475342	LARGE	BASIC FILING FEE UTILITY	$ (365.00)
16-Nov-95	08480383	LARGE	BASIC FILING FEE UTILITY	$ 365.00
17-Nov-95	08459788	SMALL	BASIC FILING FEE UTILITY	$ 365.00
22-Nov-95	08437635	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 468.00
22-Nov-95	08437635	SMALL	CLAIMS IN EXCESS OF 20	$ 286.00
22-Nov-95	08449291	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
22-Nov-95	08460668	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
27-Nov-95	08449702	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 468.00
27-Nov-95	08449702	LARGE	CLAIMS IN EXCESS OF 20	$ 176.00
27-Nov-95	08466894	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 117.00
27-Nov-95	08466894	SMALL	CLAIMS IN EXCESS OF 20	$ 33.00
27-Nov-95	08467045	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 234.00
27-Nov-95	08467045	LARGE	CLAIMS IN EXCESS OF 20	$ 66.00
27-Nov-95	08469059	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 117.00

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27-Nov-95	08469059	SMALL	CLAIMS IN EXCESS OF 20	$ 33.00
27-Nov-95	08469496	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 117.00
27-Nov-95	08469496	SMALL	CLAIMS IN EXCESS OF 20	$ 33.00
27-Nov-95	08469517	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 234.00
27-Nov-95	08469517	SMALL	CLAIMS IN EXCESS OF 20	$ 33.00
27-Nov-95	08469517	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ (234.00)
27-Nov-95	08469517	SMALL	CLAIMS IN EXCESS OF 20	$ (33.00)
27-Nov-95	08469517	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 117.00
27-Nov-95	08469517	SMALL	CLAIMS IN EXCESS OF 20	$ 33.00
27-Nov-95	08470236	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 117.00
27-Nov-95	08470236	SMALL	CLAIMS IN EXCESS OF 20	$ 33.00
27-Nov-95	08470570	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 117.00
27-Nov-95	08470570	SMALL	CLAIMS IN EXCESS OF 20	$ 33.00
27-Nov-95	08471239	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 117.00
27-Nov-95	08471239	SMALL	CLAIMS IN EXCESS OF 20	$ 33.00
27-Nov-95	08473213	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 117.00
27-Nov-95	08478864	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
27-Nov-95	08487411	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
27-Nov-95	08487506	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 468.00
27-Nov-95	08487506	LARGE	CLAIMS IN EXCESS OF 20	$ 286.00
28-Nov-95	08437629	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 312.00
28-Nov-95	08437629	SMALL	CLAIMS IN EXCESS OF 20	$ 77.00
28-Nov-95	08437629	SMALL	CLAIMS IN EXCESS OF 20	$ (77.00)
28-Nov-95	08437629	SMALL	CLAIMS IN EXCESS OF 20	$ 38.00
28-Nov-95	08447414	LARGE	BASIC FILING FEE UTILITY	$ 385.00
28-Nov-95	08447414	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 44.00
28-Nov-95	08447414	LARGE	CLAIMS IN EXCESS OF 20	$ 390.00
28-Nov-95	08447416	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
28-Nov-95	08473484	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
28-Nov-95	08473484	SMALL	CLAIMS IN EXCESS OF 20	$ 77.00
28-Nov-95	08474147	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 235.00
28-Nov-95	08474147	SMALL	CLAIMS IN EXCESS OF 20	$ 220.00
28-Nov-95	08477660	LARGE	CLAIMS IN EXCESS OF 20	$ 176.00
28-Nov-95	08477660	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 156.00
28-Nov-95	08477660	SMALL	BASIC FILING FEE UTILITY	$ 393.00
28-Nov-95	08478794	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 468.00
28-Nov-95	08478794	LARGE	CLAIMS IN EXCESS OF 20	$ 44.00
29-Nov-95	08444787	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00

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29-Nov-95	08445294	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
29-Nov-95	08445296	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
29-Nov-95	08446553	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
29-Nov-95	08447977	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
29-Nov-95	08448251	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
29-Nov-95	08473998	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
29-Nov-95	08487984	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 234.00
30-Nov-95	08437864	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 156.00
30-Nov-95	08437864	SMALL	CLAIMS IN EXCESS OF 20	$ 55.00
30-Nov-95	08444756	SMALL	CLAIMS IN EXCESS OF 20	$ 55.00
30-Nov-95	08444756	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 195.00
30-Nov-95	08446432	SMALL	CLAIMS IN EXCESS OF 20	$ 143.00
30-Nov-95	08446432	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 195.00
30-Nov-95	08449351	LARGE	CLAIMS IN EXCESS OF 20	$ 44.00
30-Nov-95	08449351	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 390.00
30-Nov-95	08449351	LARGE	BASIC FILING FEE UTILITY	$ 385.00
30-Nov-95	08449531	LARGE	CLAIMS IN EXCESS OF 20	$ 110.00
30-Nov-95	08449531	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
30-Nov-95	08449531	LARGE	MULTIPLE DEPENDENT CLAIMS	$ 250.00
30-Nov-95	08449531	LARGE	BASIC FILING FEE UTILITY	$ 385.00
30-Nov-95	08449652	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
30-Nov-95	08449717	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
30-Nov-95	08459216	LARGE	CLAIMS IN EXCESS OF 20	$ 418.00
30-Nov-95	08459216	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 624.00
30-Nov-95	08459218	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
30-Nov-95	08460240	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 468.00
30-Nov-95	08460240	LARGE	CLAIMS IN EXCESS OF 20	$ 627.00
30-Nov-95	08469103	SMALL	CLAIMS IN EXCESS OF 20	$ 176.00
30-Nov-95	08469103	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 273.00
30-Nov-95	08469626	SMALL	CLAIMS IN EXCESS OF 20	$ 99.00
30-Nov-95	08469626	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 312.00
30-Nov-95	08470448	SMALL	CLAIMS IN EXCESS OF 20	$ 66.00
30-Nov-95	08470448	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 195.00
30-Nov-95	08471238	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 234.00
30-Nov-95	08471238	LARGE	CLAIMS IN EXCESS OF 20	$ 22.00
30-Nov-95	08475341	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
30-Nov-95	08477712	SMALL	CLAIMS IN EXCESS OF 20	$ 33.00
30-Nov-95	08477712	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 117.00

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30-Nov-95	08477955	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 312.00
30-Nov-95	08477955	LARGE	CLAIMS IN EXCESS OF 20	$ 132.00
30-Nov-95	08483174	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
30-Nov-95	08487851	LARGE	CLAIMS IN EXCESS OF 20	$ 132.00
30-Nov-95	08488383	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
02-Dec-95	08474147	LARGE	BASIC FILING FEE UTILITY	$ 365.00
02-Dec-95	08485282	LARGE	BASIC FILING FEE UTILITY	$ 365.00
02-Dec-95	08485283	LARGE	BASIC FILING FEE UTILITY	$ (365.00)
02-Dec-95	08485283	LARGE	BASIC FILING FEE UTILITY	$ 365.00
02-Dec-95	08485283	LARGE	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 130.00
02-Dec-95	08485283	LARGE	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ (65.00)
04-Dec-95	08448978	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 312.00
04-Dec-95	08448978	LARGE	CLAIMS IN EXCESS OF 20	$ 198.00
04-Dec-95	08468323	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 156.00
04-Dec-95	08468323	SMALL	CLAIMS IN EXCESS OF 20	$ 44.00
04-Dec-95	08470053	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 117.00
04-Dec-95	08470053	SMALL	CLAIMS IN EXCESS OF 20	$ 33.00
04-Dec-95	08474674	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
05-Dec-95	08470447	LARGE	BASIC FILING FEE UTILITY	$ (365.00)
05-Dec-95	08470447	SMALL	BASIC FILING FEE UTILITY	$ 365.00
06-Dec-95	08470447	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 65.00
07-Dec-95	08438206	LARGE	BASIC FILING FEE UTILITY	$ 385.00
07-Dec-95	08438206	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 312.00
07-Dec-95	08439668	SMALL	CLAIMS IN EXCESS OF 20	$ 44.00
07-Dec-95	08447496	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
07-Dec-95	08447679	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
07-Dec-95	08447974	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
07-Dec-95	08449413	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
07-Dec-95	08466887	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 234.00
07-Dec-95	08466887	LARGE	CLAIMS IN EXCESS OF 20	$ 66.00
07-Dec-95	08469078	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 117.00
07-Dec-95	08469078	SMALL	CLAIMS IN EXCESS OF 20	$ 33.00
07-Dec-95	08471240	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 117.00
07-Dec-95	08471240	SMALL	CLAIMS IN EXCESS OF 20	$ 33.00
07-Dec-95	08474147	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
07-Dec-95	08474147	LARGE	BASIC FILING FEE UTILITY	$ 365.00
07-Dec-95	08474964	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 156.00
07-Dec-95	08474964	SMALL	CLAIMS IN EXCESS OF 20	$ 44.00

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07-Dec-95	08478858	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 546.00
07-Dec-95	08478858	LARGE	CLAIMS IN EXCESS OF 20	$ 330.00
07-Dec-95	08480059	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
07-Dec-95	08480059	SMALL	CLAIMS IN EXCESS OF 20	$ 38.00
07-Dec-95	08480059	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ (78.00)
07-Dec-95	08480059	SMALL	CLAIMS IN EXCESS OF 20	$ (38.00)
07-Dec-95	08480059	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
07-Dec-95	08480059	SMALL	CLAIMS IN EXCESS OF 20	$ 32.00
07-Dec-95	08480060	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 858.00
07-Dec-95	08480060	LARGE	CLAIMS IN EXCESS OF 20	$ 242.00
07-Dec-95	08480060	LARGE	CLAIMS IN EXCESS OF 20	$ 22.00
07-Dec-95	08484865	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 156.00
07-Dec-95	08484865	SMALL	CLAIMS IN EXCESS OF 20	$ 44.00
07-Dec-95	08486258	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 312.00
07-Dec-95	08486258	SMALL	CLAIMS IN EXCESS OF 20	$ 44.00
07-Dec-95	08487408	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
08-Dec-95	08441942	LARGE	BASIC FILING FEE UTILITY	$ 374.00
08-Dec-95	08441942	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 156.00
08-Dec-95	08441942	LARGE	CLAIMS IN EXCESS OF 20	$ 264.00
08-Dec-95	08480383	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 624.00
08-Dec-95	08480383	LARGE	CLAIMS IN EXCESS OF 20	$ 330.00
08-Dec-95	08486265	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
08-Dec-95	08486265	LARGE	CLAIMS IN EXCESS OF 20	$ 66.00
08-Dec-95	08486265	LARGE	BASIC FILING FEE UTILITY	$ 20.00
08-Dec-95	08486265	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 380.00
08-Dec-95	08488620	UNKNOWN	ADDITIONAL FILING RECEIPT, DUPLICATE OR CORRECTED DUE TO APPLICANT ERROR	$ 25.00
11-Dec-95	08473999	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 468.00
11-Dec-95	08483169	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
11-Dec-95	08486266	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
12-Dec-95	08435758	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 312.00
12-Dec-95	08435758	LARGE	CLAIMS IN EXCESS OF 20	$ 110.00
12-Dec-95	08437791	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 234.00
12-Dec-95	08437819	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
12-Dec-95	08437819	SMALL	CLAIMS IN EXCESS OF 20	$ 77.00
12-Dec-95	08438216	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
12-Dec-95	08446429	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 390.00
12-Dec-95	08446429	LARGE	CLAIMS IN EXCESS OF 20	$ 154.00
12-Dec-95	08446494	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 117.00

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12-Dec-95	08446494	SMALL	CLAIMS IN EXCESS OF 20	$ 55.00
12-Dec-95	08472980	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 156.00
12-Dec-95	08472980	LARGE	MULTIPLE DEPENDENT CLAIMS	$ 250.00
12-Dec-95	08487526	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
12-Dec-95	08488378	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
15-Dec-95	08447529	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
15-Dec-95	08448143	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
15-Dec-95	08451377	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
15-Dec-95	08451377	SMALL	CLAIMS IN EXCESS OF 20	$ 77.00
15-Dec-95	08477570	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
15-Dec-95	08478044	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
15-Dec-95	08483980	SMALL	CLAIMS IN EXCESS OF 20	$ 11.00
15-Dec-95	08487980	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 702.00
15-Dec-95	08487980	LARGE	CLAIMS IN EXCESS OF 20	$ 286.00
15-Dec-95	08488436	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
18-Dec-95	08447621	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 312.00
18-Dec-95	08447621	SMALL	CLAIMS IN EXCESS OF 20	$ 121.00
27-Dec-95	08467904	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 117.00
27-Dec-95	08467904	SMALL	CLAIMS IN EXCESS OF 20	$ 33.00
27-Dec-95	08468736	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 117.00
27-Dec-95	08468736	SMALL	CLAIMS IN EXCESS OF 20	$ 33.00
27-Dec-95	08470447	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 117.00
27-Dec-95	08470447	SMALL	CLAIMS IN EXCESS OF 20	$ 33.00
28-Dec-95	08442383	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 117.00
28-Dec-95	08468044	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 234.00
28-Dec-95	08468044	LARGE	CLAIMS IN EXCESS OF 20	$ 66.00
28-Dec-95	08474146	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
28-Dec-95	08483269	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
28-Dec-95	08483269	LARGE	CLAIMS IN EXCESS OF 20	$ 44.00
28-Dec-95	08485283	LARGE	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 65.00
28-Dec-95	08488032	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 468.00
28-Dec-95	08488032	SMALL	CLAIMS IN EXCESS OF 20	$ 176.00
29-Dec-95	08437937	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 156.00
29-Dec-95	08442507	LARGE	CLAIMS IN EXCESS OF 20	$ 154.00
29-Dec-95	08442507	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 156.00
29-Dec-95	08442507	LARGE	BASIC FILING FEE UTILITY	$ 705.00
29-Dec-95	08446123	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 117.00
29-Dec-95	08446431	SMALL	CLAIMS IN EXCESS OF 20	$ 264.00

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29-Dec-95	08446431	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
29-Dec-95	08446431	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 234.00
29-Dec-95	08447711	SMALL	CLAIMS IN EXCESS OF 20	$ 77.00
29-Dec-95	08447711	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 390.00
29-Dec-95	08447726	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
29-Dec-95	08448099	SMALL	CLAIMS IN EXCESS OF 20	$ 165.00
29-Dec-95	08448099	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 156.00
29-Dec-95	08448141	SMALL	CLAIMS IN EXCESS OF 20	$ 110.00
29-Dec-95	08448141	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 273.00
29-Dec-95	08450680	LARGE	CLAIMS IN EXCESS OF 20	$ 132.00
29-Dec-95	08450680	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 234.00
29-Dec-95	08450680	LARGE	BASIC FILING FEE UTILITY	$ 385.00
29-Dec-95	08452395	SMALL	CLAIMS IN EXCESS OF 20	$ 242.00
29-Dec-95	08452395	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 195.00
29-Dec-95	08468324	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 17.00
29-Dec-95	08468324	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ (17.00)
29-Dec-95	08468324	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 117.00
29-Dec-95	08474963	SMALL	CLAIMS IN EXCESS OF 20	$ 88.00
29-Dec-95	08474963	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 117.00
29-Dec-95	08478663	SMALL	CLAIMS IN EXCESS OF 20	$ 88.00
29-Dec-95	08478663	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
29-Dec-95	08479217	SMALL	CLAIMS IN EXCESS OF 20	$ 117.00
29-Dec-95	08482573	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 156.00
29-Dec-95	08484276	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 117.00
29-Dec-95	08487516	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 390.00
29-Dec-95	08487536	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 234.00
29-Dec-95	08487982	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 117.00
29-Dec-95	08498002	SMALL	CLAIMS IN EXCESS OF 20	$ 11.00
29-Dec-95	08498002	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 195.00
02-Jan-96	08486258	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 65.00
05-Jan-96	08449717	SMALL	BASIC FILING FEE UTILITY	$ 365.00
05-Jan-96	08449717	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 65.00
11-Jan-96	08113329	NOT APPLICABLE	SUBMISSION OF I.D.S. UNDER RULE 1.97(c)	$ 220.00
17-Jan-96	08449532	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
17-Jan-96	08473224	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 156.00
17-Jan-96	08477805	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 156.00
17-Jan-96	08477805	LARGE	CLAIMS IN EXCESS OF 20	$ 44.00
18-Jan-96	08113329	NOT APPLICABLE	SUBMISSION OF I.D.S. UNDER RULE 1.97(c)	$ 220.00

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DATE	SERIAL#	ENTITY	TRANSACTION AS OF JULY 15, 2000	FEE
18-Jan-96	08397582	NOT APPLICABLE	SUBMISSION OF I.D.S. UNDER RULE 1.97(c)	$ 220.00
22-Jan-96	08448326	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 117.00
22-Jan-96	08448326	SMALL	CLAIMS IN EXCESS OF 20	$ 132.00
22-Jan-96	08449798	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 234.00
22-Jan-96	08449798	LARGE	CLAIMS IN EXCESS OF 20	$ 286.00
22-Jan-96	08449798	LARGE	MULTIPLE DEPENDENT CLAIMS	$ 250.00
23-Jan-96	08397582	NOT APPLICABLE	SUBMISSION OF I.D.S. UNDER RULE 1.97(c)	$ 220.00
25-Jan-96	08449110	LARGE	BASIC FILING FEE UTILITY	$ 385.00
25-Jan-96	08449110	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 21.00
25-Jan-96	08449110	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 135.00
25-Jan-96	08449110	LARGE	MULTIPLE DEPENDENT CLAIMS	$ 250.00
25-Jan-96	08449281	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 234.00
25-Jan-96	08449281	SMALL	CLAIMS IN EXCESS OF 20	$ 209.00
25-Jan-96	08449281	SMALL	MULTIPLE DEPENDENT CLAIMS	$ 125.00
25-Jan-96	08449523	LARGE	BASIC FILING FEE UTILITY	$ 385.00
25-Jan-96	08449523	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 780.00
25-Jan-96	08449523	LARGE	CLAIMS IN EXCESS OF 20	$ 682.00
25-Jan-96	08449800	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 195.00
25-Jan-96	08449800	SMALL	CLAIMS IN EXCESS OF 20	$ 165.00
25-Jan-96	08449800	SMALL	MULTIPLE DEPENDENT CLAIMS	$ 125.00
25-Jan-96	08449867	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 1,014.00
25-Jan-96	08449867	LARGE	CLAIMS IN EXCESS OF 20	$ 704.00
25-Jan-96	08449867	LARGE	BASIC FILING FEE UTILITY	$ 385.00
25-Jan-96	08451203	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 624.00
25-Jan-96	08451203	LARGE	CLAIMS IN EXCESS OF 20	$ 682.00
25-Jan-96	08451203	LARGE	BASIC FILING FEE UTILITY	$ 375.00
25-Jan-96	08451203	LARGE	CLAIMS IN EXCESS OF 20	$ 222.00
25-Jan-96	08451746	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 624.00
25-Jan-96	08451746	LARGE	CLAIMS IN EXCESS OF 20	$ 704.00
25-Jan-96	08460401	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 117.00
25-Jan-96	08460401	SMALL	CLAIMS IN EXCESS OF 20	$ 132.00
25-Jan-96	08460401	SMALL	MULTIPLE DEPENDENT CLAIMS	$ 125.00
25-Jan-96	08466888	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 234.00
25-Jan-96	08466888	SMALL	CLAIMS IN EXCESS OF 20	$ 231.00
25-Jan-96	08466888	SMALL	MULTIPLE DEPENDENT CLAIMS	$ 125.00
25-Jan-96	08468641	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 273.00
25-Jan-96	08468641	SMALL	CLAIMS IN EXCESS OF 20	$ 165.00
25-Jan-96	08469056	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 546.00

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DATE	SERIAL#	ENTITY	TRANSACTION AS OF JULY 15, 2000	FEE
25-Jan-96	08469056	LARGE	CLAIMS IN EXCESS OF 20	$ 330.00
25-Jan-96	08469108	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 351.00
25-Jan-96	08469108	SMALL	CLAIMS IN EXCESS OF 20	$ 540.00
25-Jan-96	08469624	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 273.00
25-Jan-96	08469624	SMALL	CLAIMS IN EXCESS OF 20	$ 176.00
25-Jan-96	08469624	SMALL	MULTIPLE DEPENDENT CLAIMS	$ 125.00
25-Jan-96	08470054	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 468.00
25-Jan-96	08470054	LARGE	CLAIMS IN EXCESS OF 20	$ 352.00
25-Jan-96	08471191	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 273.00
25-Jan-96	08471191	SMALL	CLAIMS IN EXCESS OF 20	$ 209.00
25-Jan-96	08471191	SMALL	MULTIPLE DEPENDENT CLAIMS	$ 125.00
25-Jan-96	08487649	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 702.00
25-Jan-96	08487649	LARGE	CLAIMS IN EXCESS OF 20	$ 682.00
25-Jan-96	08487981	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 117.00
25-Jan-96	08488058	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 390.00
25-Jan-96	08488058	SMALL	CLAIMS IN EXCESS OF 20	$ 352.00
25-Jan-96	08488620	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 117.00
25-Jan-96	08488620	SMALL	CLAIMS IN EXCESS OF 20	$ 55.00
25-Jan-96	08488620	SMALL	MULTIPLE DEPENDENT CLAIMS	$ 125.00
30-Jan-96	08449248	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
30-Jan-96	08449248	SMALL	CLAIMS IN EXCESS OF 20	$ 88.00
30-Jan-96	08460793	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 936.00
30-Jan-96	08460793	LARGE	CLAIMS IN EXCESS OF 20	$ 726.00
30-Jan-96	08469106	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 468.00
30-Jan-96	08469106	SMALL	CLAIMS IN EXCESS OF 20	$ 374.00
30-Jan-96	08469355	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 546.00
30-Jan-96	08469355	SMALL	CLAIMS IN EXCESS OF 20	$ 374.00
30-Jan-96	08470051	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 468.00
30-Jan-96	08470051	SMALL	CLAIMS IN EXCESS OF 20	$ 352.00
30-Jan-96	08470571	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 468.00
30-Jan-96	08470571	SMALL	CLAIMS IN EXCESS OF 20	$ 374.00
31-Jan-96	08486258	LARGE	BASIC FILING FEE UTILITY	$ (365.00)
31-Jan-96	08486258	SMALL	BASIC FILING FEE UTILITY	$ 365.00
05-Feb-96	08056501	NOT APPLICABLE	RECORDING EACH PATENT ASSIGNMENT, AGREEMENT, OR OTHER PAPER, PER PROPERTY	$ 320.00
05-Feb-96	08056501	NOT APPLICABLE	RECORDING EACH PATENT ASSIGNMENT, AGREEMENT, OR OTHER PAPER, PER PROPERTY	$ 320.00
05-Feb-96	08056501	NOT APPLICABLE	RECORDING EACH PATENT ASSIGNMENT, AGREEMENT, OR OTHER PAPER, PER PROPERTY	$ (320.00)
05-Feb-96	08113329	NOT APPLICABLE	RECORDING EACH PATENT ASSIGNMENT, AGREEMENT, OR OTHER PAPER, PER PROPERTY	$ 320.00
05-Feb-96	08397582	NOT APPLICABLE	RECORDING EACH PATENT ASSIGNMENT, AGREEMENT, OR OTHER PAPER, PER PROPERTY	$ 320.00

DATE	SERIAL#	ENTITY	TRANSACTION AS OF JULY 15, 2000	FEE
09-Feb-96	08466890	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 468.00
09-Feb-96	08466890	SMALL	CLAIMS IN EXCESS OF 20	$ 396.00
09-Feb-96	08468994	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
09-Feb-96	08468994	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
09-Feb-96	08468994	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ (110.00)
09-Feb-96	08468994	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
09-Feb-96	08468994	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ (110.00)
09-Feb-96	08468994	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ (110.00)
09-Feb-96	08468994	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
09-Feb-96	08473996	SMALL	CLAIMS IN EXCESS OF 20	$ 55.00
22-Feb-96	08460120	SMALL	CLAIMS IN EXCESS OF 20	$ 253.00
22-Feb-96	08460120	SMALL	MULTIPLE DEPENDENT CLAIMS	$ 125.00
22-Feb-96	08469078	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
22-Feb-96	08469078	SMALL	CLAIMS IN EXCESS OF 20	$ 11.00
22-Feb-96	08469612	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
22-Feb-96	08469612	SMALL	CLAIMS IN EXCESS OF 20	$ 66.00
22-Feb-96	08469612	SMALL	MULTIPLE DEPENDENT CLAIMS	$ 125.00
22-Feb-96	08471024	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
22-Feb-96	08471024	SMALL	CLAIMS IN EXCESS OF 20	$ 22.00
26-Feb-96	08444781	LARGE	CLAIMS IN EXCESS OF 20	$ 220.00
26-Feb-96	08469107	SMALL	CLAIMS IN EXCESS OF 20	$ 594.00
26-Feb-96	08469107	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 117.00
05-Mar-96	08448794	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 936.00
05-Mar-96	08448976	LARGE	BASIC FILING FEE UTILITY	$ 385.00
05-Mar-96	08449718	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
05-Mar-96	08449718	LARGE	BASIC FILING FEE UTILITY	$ 385.00
05-Mar-96	08460743	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
05-Mar-96	08466894	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
07-Mar-96	08448175	LARGE	BASIC FILING FEE UTILITY	$ 385.00
07-Mar-96	08448175	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 234.00
07-Mar-96	08458566	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 117.00
07-Mar-96	08459217	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 234.00
07-Mar-96	08460120	SMALL	CLAIMS IN EXCESS OF 20	$ 22.00
07-Mar-96	08460713	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
07-Mar-96	08469109	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
07-Mar-96	08469623	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
07-Mar-96	08472066	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
07-Mar-96	08479523	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00

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DATE	SERIAL#	ENTITY	TRANSACTION AS OF JULY 15, 2000	FEE
11-Mar-96	08397582	NOT APPLICABLE	SUBMISSION OF I.D.S. UNDER RULE 1.97(c)	$ 220.00
11-Mar-96	08397582	NOT APPLICABLE	PETITIONS TO THE COMMISSIONER UNLESS OTHERWISE SPECIFIED	$ 130.00
11-Mar-96	08397582	LARGE	BASIC FILING FEE UTILITY	$ 684.00
11-Mar-96	08459788	LARGE	BASIC FILING FEE UTILITY	$ (365.00)
11-Mar-96	08459788	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 365.00
11-Mar-96	08459788	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ (300.00)
13-Mar-96	08448662	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 312.00
13-Mar-96	08448979	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 156.00
13-Mar-96	08460043	LARGE	BASIC FILING FEE UTILITY	$ 385.00
13-Mar-96	08460081	LARGE	BASIC FILING FEE UTILITY	$ 385.00
13-Mar-96	08460085	LARGE	BASIC FILING FEE UTILITY	$ 385.00
13-Mar-96	08460770	LARGE	BASIC FILING FEE UTILITY	$ 385.00
19-Mar-96	08446123	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
19-Mar-96	08473224	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
21-Mar-96	08468994	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ (78.00)
21-Mar-96	08468994	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 65.00
21-Mar-96	08468994	UNKNOWN	UNSPECIFIED OTHER SERVICES, EXCLUDING LABOR	$ 13.00
25-Mar-96	08446123	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
25-Mar-96	08471024	SMALL	CLAIMS IN EXCESS OF 20	$ 11.00
26-Mar-96	08444786	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
26-Mar-96	08445054	LARGE	CLAIMS IN EXCESS OF 20	$ 39.00
26-Mar-96	08448326	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
26-Mar-96	08448326	SMALL	CLAIMS IN EXCESS OF 20	$ 11.00
26-Mar-96	08478107	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 156.00
28-Mar-96	08441821	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
28-Mar-96	08475342	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 156.00
03-Apr-96	08473224	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
05-Apr-96	08460187	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 117.00
05-Apr-96	08460677	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 117.00
05-Apr-96	08460817	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
11-Apr-96	08485282	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 65.00
11-Apr-96	08485283	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ (65.00)
12-Apr-96	08485775	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 65.00
17-Apr-96	08445045	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 351.00
17-Apr-96	08446124	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
17-Apr-96	08447447	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 156.00
17-Apr-96	08447908	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
17-Apr-96	08458699	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00

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17-Apr-96	08460556	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
17-Apr-96	08460557	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
17-Apr-96	08460634	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
17-Apr-96	08460642	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
17-Apr-96	08460766	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
17-Apr-96	08479215	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
17-Apr-96	08479414	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
17-Apr-96	08484858	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
17-Apr-96	08486297	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
17-Apr-96	08487428	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
18-Apr-96	08474119	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
18-Apr-96	08486259	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
18-Apr-96	08486259	SMALL	CLAIMS IN EXCESS OF 20	$ 33.00
18-Apr-96	08487565	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
22-Apr-96	08397582	LARGE	UTILITY ISSUE FEE	$ 1,250.00
22-Apr-96	08397582	NOT APPLICABLE	PRINTED COPY OF PATENT W/O COLOR, REGULAR SERVICE	$ 90.00
22-Apr-96	08460387	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 546.00
22-Apr-96	08460592	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
24-Apr-96	08485282	LARGE	BASIC FILING FEE UTILITY	$ (365.00)
26-Apr-96	08113329	NOT APPLICABLE	SUBMISSION OF I.D.S. UNDER RULE 1.97(c)	$ 130.00
30-Apr-96	08485282	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
07-May-96	08474496	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
08-May-96	08397582	NOT APPLICABLE	PETITIONS TO THE COMMISSIONER UNLESS OTHERWISE SPECIFIED	$ 130.00
09-May-96	08444788	LARGE	BASIC FILING FEE UTILITY	$ 385.00
09-May-96	08460274	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
09-May-96	08460711	LARGE	BASIC FILING FEE UTILITY	$ 385.00
09-May-96	08460711	LARGE	CLAIMS IN EXCESS OF 20	$ 78.00
13-May-96	08445054	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
13-May-96	08459521	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 156.00
15-May-96	08444757	LARGE	BASIC FILING FEE UTILITY	$ 385.00
15-May-96	08444786	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
15-May-96	08447724	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
17-May-96	08444887	SMALL	BASIC FILING FEE UTILITY	$ 385.00
17-May-96	08447449	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
17-May-96	08447611	LARGE	BASIC FILING FEE UTILITY	$ 385.00
17-May-96	08448309	LARGE	BASIC FILING FEE UTILITY	$ 385.00
21-May-96	08469517	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ (117.00)
21-May-96	08469517	SMALL	CLAIMS IN EXCESS OF 20	$ (33.00)

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21-May-96	08469517	LARGE	BASIC FILING FEE UTILITY	$ 117.00
21-May-96	08469517	LARGE	BASIC FILING FEE UTILITY	$ 33.00
21-May-96	08485773	LARGE	BASIC FILING FEE UTILITY	$ 495.00
21-May-96	08485773	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
21-May-96	08485773	LARGE	BASIC FILING FEE UTILITY	$ 365.00
22-May-96	08438011	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
22-May-96	08447415	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 156.00
22-May-96	08459788	LARGE	BASIC FILING FEE UTILITY	$ 385.00
22-May-96	08478908	LARGE	BASIC FILING FEE UTILITY	$ 385.00
22-May-96	08487410	LARGE	BASIC FILING FEE UTILITY	$ 385.00
24-May-96	08448116	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 156.00
24-May-96	08448116	LARGE	CLAIMS IN EXCESS OF 20	$ 264.00
28-May-96	08441575	NOT APPLICABLE	PETITIONS TO THE COMMISSIONER UNLESS OTHERWISE SPECIFIED	$ (130.00)
06-Jun-96	08447380	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
06-Jun-96	08469517	LARGE	BASIC FILING FEE UTILITY	$ 215.00
06-Jun-96	08469517	LARGE	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 130.00
06-Jun-96	08475341	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
10-Jun-96	08444758	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 156.00
10-Jun-96	08444758	SMALL	CLAIMS IN EXCESS OF 20	$ 11.00
10-Jun-96	08479414	SMALL	CLAIMS IN EXCESS OF 20	$ 11.00
19-Jun-96	08447449	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
19-Jun-96	08447449	NOT APPLICABLE	PETITIONS TO THE COMMISSIONER UNLESS OTHERWISE SPECIFIED	$ (130.00)
27-Jun-96	08483980	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 65.00
17-Jul-96	08466894	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 65.00
01-Aug-96	08446123	SMALL	CLAIMS IN EXCESS OF 20	$ 39.00
01-Aug-96	08446124	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
01-Aug-96	08446430	LARGE	CLAIMS IN EXCESS OF 20	$ 44.00
15-Aug-96	08487546	LARGE	FILING A BRIEF IN SUPPORT OF AN APPEAL	$ 290.00
20-Aug-96	08113329	SMALL	NOTICE OF APPEAL	$ 145.00
28-Aug-96	08447449	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
28-Aug-96	08447449	LARGE	BASIC FILING FEE UTILITY	$ 365.00
28-Aug-96	08447449	SMALL	BASIC FILING FEE UTILITY	$ (365.00)
28-Aug-96	08447449	LARGE	BASIC FILING FEE UTILITY	$ 365.00
05-Sep-96	08441575	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ (78.00)
05-Sep-96	08441575	LARGE	BASIC FILING FEE UTILITY	$ (375.00)
05-Sep-96	08441575	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ (156.00)
18-Sep-96	08113329	LARGE	FILING A BRIEF IN SUPPORT OF AN APPEAL	$ 290.00
01-Oct-96	08447712	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 160.00

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01-Oct-96	08447712	LARGE	CLAIMS IN EXCESS OF 20	$ 264.00
01-Oct-96	08447712	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
02-Oct-96	08449652	SMALL	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 195.00
02-Oct-96	08449652	SMALL	CLAIMS IN EXCESS OF 20	$ 11.00
08-Oct-96	08447447	SMALL	CLAIMS IN EXCESS OF 20	$ 33.00
10-Oct-96	08444758	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 40.00
10-Oct-96	08447496	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 40.00
10-Oct-96	08458566	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 40.00
10-Oct-96	08473997	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 120.00
10-Oct-96	08473997	SMALL	CLAIMS IN EXCESS OF 20	$ 187.00
10-Oct-96	08478107	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 80.00
31-Oct-96	08448175	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 234.00
06-Nov-96	08448143	SMALL	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 195.00
06-Nov-96	08448143	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 160.00
06-Nov-96	08448143	SMALL	CLAIMS IN EXCESS OF 20	$ 154.00
07-Nov-96	08444787	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 160.00
07-Nov-96	08447974	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
07-Nov-96	08447974	SMALL	CLAIMS IN EXCESS OF 20	$ 44.00
12-Nov-96	08445294	SMALL	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 195.00
12-Nov-96	08445294	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 120.00
12-Nov-96	08445294	SMALL	CLAIMS IN EXCESS OF 20	$ 264.00
12-Nov-96	08447502	SMALL	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 195.00
12-Nov-96	08447502	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 120.00
12-Nov-96	08447502	SMALL	SURCHARGE - LATE FILING FEE OR OATH OR DECLARATION	$ 275.00
12-Nov-96	08447529	SMALL	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 195.00
12-Nov-96	08447529	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 80.00
12-Nov-96	08447529	LARGE	CLAIMS IN EXCESS OF 20	$ 297.00
14-Nov-96	08447712	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
14-Nov-96	08473484	LARGE	CLAIMS IN EXCESS OF 20	$ 198.00
14-Nov-96	08473484	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 390.00
25-Nov-96	08448251	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 160.00
25-Nov-96	08448251	SMALL	CLAIMS IN EXCESS OF 20	$ 495.00
25-Nov-96	08448251	SMALL	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 195.00
04-Dec-96	08056501	NOT APPLICABLE	CERTIFIED OR UNCERTIFIED COPY OF PATENT-RELATED FILE WRAPPER AND CONTENTS	$ 150.00
11-Dec-96	08449718	LARGE	CLAIMS IN EXCESS OF 20	$ 990.00
11-Dec-96	08449718	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 320.00
11-Dec-96	08449718	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
13-Dec-96	08447977	SMALL	CLAIMS IN EXCESS OF 20	$ 495.00

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13-Dec-96	08447977	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 160.00
13-Dec-96	08447977	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
18-Dec-96	08460770	SMALL	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 195.00
18-Dec-96	08460770	SMALL	CLAIMS IN EXCESS OF 20	$ 407.00
20-Dec-96	08460711	SMALL	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 195.00
20-Dec-96	08460711	SMALL	CLAIMS IN EXCESS OF 20	$ 414.00
23-Dec-96	08460817	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 40.00
23-Dec-96	08474496	SMALL	CLAIMS IN EXCESS OF 20	$ 11.00
23-Dec-96	08474496	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 40.00
23-Dec-96	08485282	SMALL	CLAIMS IN EXCESS OF 20	$ 11.00
23-Dec-96	08485282	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 40.00
23-Dec-96	08488436	SMALL	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 195.00
23-Dec-96	08488436	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 80.00
23-Dec-96	08488436	SMALL	CLAIMS IN EXCESS OF 20	$ 132.00
26-Dec-96	08487155	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 40.00
03-Jan-97	08448979	LARGE	CLAIMS IN EXCESS OF 20	$ 154.00
03-Jan-97	08448979	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 390.00
06-Jan-97	08448662	LARGE	CLAIMS IN EXCESS OF 20	$ 572.00
06-Jan-97	08448662	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 390.00
06-Jan-97	08460387	LARGE	CLAIMS IN EXCESS OF 20	$ 814.00
06-Jan-97	08460387	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 390.00
08-Jan-97	08437791	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 240.00
08-Jan-97	08437791	LARGE	CLAIMS IN EXCESS OF 20	$ 66.00
08-Jan-97	08459217	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
08-Jan-97	08459217	LARGE	CLAIMS IN EXCESS OF 20	$ 374.00
09-Jan-97	08435758	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 240.00
09-Jan-97	08435758	LARGE	CLAIMS IN EXCESS OF 20	$ 66.00
09-Jan-97	08439670	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 240.00
09-Jan-97	08439670	LARGE	CLAIMS IN EXCESS OF 20	$ 66.00
09-Jan-97	08448141	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 120.00
09-Jan-97	08448141	SMALL	CLAIMS IN EXCESS OF 20	$ 33.00
14-Jan-97	08460043	LARGE	CLAIMS IN EXCESS OF 20	$ 110.00
14-Jan-97	08460043	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 320.00
14-Jan-97	08460043	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 390.00
14-Jan-97	08460085	SMALL	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 195.00
14-Jan-97	08460085	SMALL	CLAIMS IN EXCESS OF 20	$ 66.00
14-Jan-97	08460085	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 160.00
14-Jan-97	08460591	SMALL	CLAIMS IN EXCESS OF 20	$ 319.00

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14-Jan-97	08460591	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 160.00
14-Jan-97	08460591	SMALL	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 195.00
24-Jan-97	08460081	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
24-Jan-97	08460081	LARGE	CLAIMS IN EXCESS OF 20	$ 650.00
24-Jan-97	08460274	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 390.00
24-Jan-97	08460274	LARGE	CLAIMS IN EXCESS OF 20	$ 902.00
27-Jan-97	08449097	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 390.00
27-Jan-97	08449097	LARGE	CLAIMS IN EXCESS OF 20	$ 748.00
30-Jan-97	08444887	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
30-Jan-97	08444887	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 80.00
30-Jan-97	08444887	LARGE	CLAIMS IN EXCESS OF 20	$ 88.00
03-Feb-97	08448976	LARGE	CLAIMS IN EXCESS OF 20	$ 484.00
03-Feb-97	08448976	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
03-Feb-97	08458760	LARGE	CLAIMS IN EXCESS OF 20	$ 506.00
03-Feb-97	08458760	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 320.00
03-Feb-97	08458760	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 390.00
10-Feb-97	08482574	LARGE	CLAIMS IN EXCESS OF 20	$ 660.00
10-Feb-97	08482574	LARGE	CLAIMS IN EXCESS OF 20	$ 160.00
10-Feb-97	08482574	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 390.00
13-Feb-97	08459522	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 320.00
13-Feb-97	08459522	LARGE	CLAIMS IN EXCESS OF 20	$ 1,056.00
18-Feb-97	08460043	LARGE	CLAIMS IN EXCESS OF 20	$ 22.00
24-Feb-97	08441880	LARGE	CLAIMS IN EXCESS OF 20	$ 418.00
24-Feb-97	08441880	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 40.00
24-Feb-97	08441880	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 195.00
28-Feb-97	08113329	NOT APPLICABLE	PETITIONS TO THE COMMISSIONER UNLESS OTHERWISE SPECIFIED	$ 130.00
28-Feb-97	08447712	NOT APPLICABLE	PETITIONS TO THE COMMISSIONER UNLESS OTHERWISE SPECIFIED	$ 130.00
03-Mar-97	08442369	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
03-Mar-97	08442369	LARGE	CLAIMS IN EXCESS OF 20	$ 44.00
03-Mar-97	08484858	SMALL	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 55.00
03-Mar-97	08484858	SMALL	CLAIMS IN EXCESS OF 20	$ 154.00
04-Mar-97	08459522	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
04-Mar-97	08460591	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 195.00
04-Mar-97	08460591	LARGE	CLAIMS IN EXCESS OF 20	$ 319.00
04-Mar-97	08460591	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 160.00
04-Mar-97	08472399	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
05-Mar-97	08437819	SMALL	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 55.00
05-Mar-97	08437819	SMALL	CLAIMS IN EXCESS OF 20	$ 22.00

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10-Mar-97	08472399	SMALL	CLAIMS IN EXCESS OF 20	$ 264.00
12-Mar-97	08479524	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 390.00
12-Mar-97	08479524	LARGE	CLAIMS IN EXCESS OF 20	$ 176.00
12-Mar-97	08479524	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
12-Mar-97	08479524	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 2.00
13-Mar-97	08441996	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
13-Mar-97	08441996	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 80.00
13-Mar-97	08441996	LARGE	CLAIMS IN EXCESS OF 20	$ 814.00
13-Mar-97	08448917	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
13-Mar-97	08459507	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
13-Mar-97	08459507	LARGE	CLAIMS IN EXCESS OF 20	$ 374.00
27-Mar-97	08449531	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 390.00
07-Apr-97	08444757	LARGE	CLAIMS IN EXCESS OF 20	$ 704.00
07-Apr-97	08444757	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 390.00
07-Apr-97	08444757	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ (390.00)
07-Apr-97	08444757	LARGE	CLAIMS IN EXCESS OF 20	$ (704.00)
07-Apr-97	08444757	LARGE	CLAIMS IN EXCESS OF 20	$ 704.00
07-Apr-97	08444757	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 380.00
07-Apr-97	08444757	LARGE	CLAIMS IN EXCESS OF 20	$ 10.00
16-Apr-97	08484275	SMALL	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 195.00
24-Apr-97	08487155	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 40.00
29-Apr-97	08437629	SMALL	CLAIMS IN EXCESS OF 20	$ 286.00
29-Apr-97	08437629	SMALL	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 195.00
01-May-97	08472066	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
01-May-97	08472066	SMALL	CLAIMS IN EXCESS OF 20	$ 374.00
02-May-97	08447611	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
02-May-97	08447611	LARGE	CLAIMS IN EXCESS OF 20	$ 396.00
02-May-97	08460677	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
02-May-97	08460677	LARGE	CLAIMS IN EXCESS OF 20	$ 220.00
02-May-97	08460677	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 120.00
02-May-97	08480392	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
02-May-97	08480392	LARGE	CLAIMS IN EXCESS OF 20	$ 154.00
05-May-97	08447938	SMALL	CLAIMS IN EXCESS OF 20	$ 187.00
05-May-97	08447938	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
05-May-97	08488439	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 39.00
14-May-97	08482573	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
14-May-97	08482573	LARGE	CLAIMS IN EXCESS OF 20	$ 440.00
15-May-97	08472066	SMALL	CLAIMS IN EXCESS OF 20	$ 44.00

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16-May-97	08449532	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
16-May-97	08449532	SMALL	CLAIMS IN EXCESS OF 20	$ 77.00
16-May-97	08460743	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
16-May-97	08460743	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 160.00
16-May-97	08460743	LARGE	CLAIMS IN EXCESS OF 20	$ 1,078.00
16-May-97	08469623	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
16-May-97	08469623	SMALL	CLAIMS IN EXCESS OF 20	$ 440.00
19-May-97	08447826	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
19-May-97	08447826	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 80.00
19-May-97	08447826	LARGE	CLAIMS IN EXCESS OF 20	$ 249.00
19-May-97	08447826	LARGE	CLAIMS IN EXCESS OF 20	$ 169.00
19-May-97	08449110	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
19-May-97	08449110	LARGE	CLAIMS IN EXCESS OF 20	$ 1,100.00
19-May-97	08479667	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
20-May-97	08448833	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
20-May-97	08448833	NOT APPLICABLE	SUBMISSION OF I.D.S. UNDER RULE 1.97(c)	$ 10.00
20-May-97	08448833	NOT APPLICABLE	SUBMISSION OF I.D.S. UNDER RULE 1.97(c)	$ 220.00
27-May-97	08441942	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
27-May-97	08448099	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
27-May-97	08448099	SMALL	CLAIMS IN EXCESS OF 20	$ 187.00
27-May-97	08450680	LARGE	CLAIMS IN EXCESS OF 20	$ 352.00
27-May-97	08450680	UNKNOWN	UNDETERMINED CLAIMS	$ 20.00
27-May-97	08450680	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
27-May-97	08458566	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
27-May-97	08460642	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
27-May-97	08469626	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
27-May-97	08469626	SMALL	CLAIMS IN EXCESS OF 20	$ 154.00
27-May-97	08482857	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
27-May-97	08482857	SMALL	CLAIMS IN EXCESS OF 20	$ 77.00
28-May-97	08437045	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
28-May-97	08477564	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
28-May-97	08477564	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 40.00
28-May-97	08477564	SMALL	CLAIMS IN EXCESS OF 20	$ 154.00
28-May-97	08477564	SMALL	MULTIPLE DEPENDENT CLAIMS	$ 130.00
29-May-97	08446432	SMALL	CLAIMS IN EXCESS OF 20	$ 341.00
29-May-97	08446432	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
29-May-97	08446553	SMALL	CLAIMS IN EXCESS OF 20	$ 165.00
29-May-97	08446553	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 120.00

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29-May-97	08446553	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$	465.00
29-May-97	08449351	LARGE	CLAIMS IN EXCESS OF 20	$	374.00
29-May-97	08449351	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$	80.00
29-May-97	08449351	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$	930.00
29-May-97	08449717	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$	465.00
29-May-97	08449717	SMALL	CLAIMS IN EXCESS OF 20	$	77.00
29-May-97	08449829	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$	930.00
29-May-97	08449829	LARGE	CLAIMS IN EXCESS OF 20	$	132.00
29-May-97	08469109	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$	465.00
29-May-97	08469109	SMALL	CLAIMS IN EXCESS OF 20	$	77.00
02-Jun-97	08472462	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$	465.00
02-Jun-97	08472462	SMALL	CLAIMS IN EXCESS OF 20	$	22.00
03-Jun-97	08446494	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$	465.00
03-Jun-97	08446494	SMALL	CLAIMS IN EXCESS OF 20	$	627.00
03-Jun-97	08446494	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$	120.00
03-Jun-97	08448978	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$	930.00
03-Jun-97	08449901	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$	465.00
04-Jun-97	08437887	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$	930.00
04-Jun-97	08437887	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$	160.00
04-Jun-97	08437887	LARGE	CLAIMS IN EXCESS OF 20	$	770.00
04-Jun-97	08448916	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$	390.00
04-Jun-97	08448916	LARGE	FILING A BRIEF IN SUPPORT OF AN APPEAL	$	300.00
04-Jun-97	08460634	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$	465.00
05-Jun-97	08477660	LARGE	CLAIMS IN EXCESS OF 20	$	22.00
05-Jun-97	08477660	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$	930.00
05-Jun-97	08480740	SMALL	CLAIMS IN EXCESS OF 20	$	165.00
05-Jun-97	08480740	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$	465.00
06-Jun-97	08437044	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$	465.00
06-Jun-97	08437044	SMALL	CLAIMS IN EXCESS OF 20	$	44.00
06-Jun-97	08447416	LARGE	CLAIMS IN EXCESS OF 20	$	330.00
06-Jun-97	08447416	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$	120.00
06-Jun-97	08447416	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$	465.00
09-Jun-97	08447496	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$	160.00
09-Jun-97	08447496	SMALL	CLAIMS IN EXCESS OF 20	$	605.00
09-Jun-97	08447496	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$	465.00
09-Jun-97	08477955	SMALL	CLAIMS IN EXCESS OF 20	$	143.00
09-Jun-97	08477955	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$	465.00
10-Jun-97	08441577	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$	465.00

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10-Jun-97	08449531	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
10-Jun-97	08449531	SMALL	CLAIMS IN EXCESS OF 20	$ 286.00
10-Jun-97	08459506	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
10-Jun-97	08459506	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 40.00
10-Jun-97	08475341	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
10-Jun-97	08475341	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 120.00
10-Jun-97	08475341	SMALL	CLAIMS IN EXCESS OF 20	$ 121.00
10-Jun-97	08478864	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
10-Jun-97	08478864	SMALL	CLAIMS IN EXCESS OF 20	$ 572.00
10-Jun-97	08478864	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 160.00
10-Jun-97	08479216	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
10-Jun-97	08479216	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 80.00
10-Jun-97	08479216	LARGE	CLAIMS IN EXCESS OF 20	$ 88.00
10-Jun-97	08479216	LARGE	CLAIMS IN EXCESS OF 20	$ (88.00)
10-Jun-97	08485507	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
10-Jun-97	08485507	LARGE	CLAIMS IN EXCESS OF 20	$ 132.00
10-Jun-97	08485507	UNKNOWN	UNDETERMINED CLAIMS	$ 11.00
10-Jun-97	08485507	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 2.00
10-Jun-97	08485507	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
10-Jun-97	08487981	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
10-Jun-97	08487981	SMALL	CLAIMS IN EXCESS OF 20	$ 33.00
11-Jun-97	08445054	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
11-Jun-97	08445054	SMALL	CLAIMS IN EXCESS OF 20	$ 77.00
11-Jun-97	08445054	UNKNOWN	SUSPENDED AMOUNTS	$ 1.00
11-Jun-97	08447447	SMALL	CLAIMS IN EXCESS OF 20	$ 198.00
11-Jun-97	08447447	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
11-Jun-97	08447724	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
11-Jun-97	08473213	SMALL	CLAIMS IN EXCESS OF 20	$ 528.00
11-Jun-97	08473213	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 480.00
11-Jun-97	08473213	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
11-Jun-97	08477711	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
11-Jun-97	08477711	SMALL	CLAIMS IN EXCESS OF 20	$ 275.00
11-Jun-97	08478794	LARGE	CLAIMS IN EXCESS OF 20	$ 286.00
11-Jun-97	08478794	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 160.00
11-Jun-97	08478794	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
11-Jun-97	08479375	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 40.00
11-Jun-97	08479375	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
16-Jun-97	08444758	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00

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16-Jun-97	08444758	SMALL	CLAIMS IN EXCESS OF 20	$ 44.00
16-Jun-97	08460765	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
17-Jun-97	08474964	SMALL	CLAIMS IN EXCESS OF 20	$ 99.00
17-Jun-97	08474964	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
17-Jun-97	08478544	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 40.00
17-Jun-97	08478544	SMALL	CLAIMS IN EXCESS OF 20	$ 11.00
17-Jun-97	08478544	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 1.00
17-Jun-97	08478544	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 464.00
18-Jun-97	08446123	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
18-Jun-97	08446123	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 40.00
18-Jun-97	08446123	SMALL	CLAIMS IN EXCESS OF 20	$ 110.00
18-Jun-97	08449291	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
18-Jun-97	08473996	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
18-Jun-97	08473996	SMALL	CLAIMS IN EXCESS OF 20	$ 187.00
18-Jun-97	08477547	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
18-Jun-97	08478107	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
18-Jun-97	08478107	LARGE	CLAIMS IN EXCESS OF 20	$ 396.00
19-Jun-97	08444756	SMALL	CLAIMS IN EXCESS OF 20	$ 22.00
19-Jun-97	08444756	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
19-Jun-97	08444756	LARGE	CLAIMS IN EXCESS OF 20	$ 44.00
19-Jun-97	08448916	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
19-Jun-97	08472980	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
19-Jun-97	08472980	LARGE	CLAIMS IN EXCESS OF 20	$ 220.00
19-Jun-97	08474119	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
19-Jun-97	08479374	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
20-Jun-97	08448116	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
20-Jun-97	08467045	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
20-Jun-97	08467904	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 240.00
20-Jun-97	08467904	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
20-Jun-97	08468044	LARGE	CLAIMS IN EXCESS OF 20	$ 198.00
20-Jun-97	08468044	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
20-Jun-97	08471238	LARGE	CLAIMS IN EXCESS OF 20	$ 198.00
20-Jun-97	08471238	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
20-Jun-97	08471240	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
23-Jun-97	08460240	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
23-Jun-97	08460256	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
23-Jun-97	08460256	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 80.00
23-Jun-97	08460556	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00

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24-Jun-97	08448643	SMALL	CLAIMS IN EXCESS OF 20	$ 77.00
24-Jun-97	08448643	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
24-Jun-97	08460557	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
25-Jun-97	08446553	SMALL	CLAIMS IN EXCESS OF 20	$ 22.00
26-Jun-97	08441027	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
26-Jun-97	08448175	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
26-Jun-97	08484276	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
26-Jun-97	08484276	SMALL	CLAIMS IN EXCESS OF 20	$ 22.00
27-Jun-97	08487397	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
30-Jun-97	08442505	LARGE	CLAIMS IN EXCESS OF 20	$ 440.00
30-Jun-97	08442505	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
30-Jun-97	08448326	SMALL	CLAIMS IN EXCESS OF 20	$ 66.00
30-Jun-97	08448326	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
02-Jul-97	08449652	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
02-Jul-97	08451496	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
02-Jul-97	08451496	LARGE	CLAIMS IN EXCESS OF 20	$ 176.00
02-Jul-97	08474145	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
02-Jul-97	08481074	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
02-Jul-97	08481074	SMALL	CLAIMS IN EXCESS OF 20	$ 11.00
02-Jul-97	08481074	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 40.00
03-Jul-97	08444788	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
03-Jul-97	08445296	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
03-Jul-97	08447726	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
03-Jul-97	08469612	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
03-Jul-97	08473999	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
03-Jul-97	08473999	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 160.00
03-Jul-97	08479215	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
03-Jul-97	08485283	SMALL	CLAIMS IN EXCESS OF 20	$ 198.00
03-Jul-97	08485283	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
03-Jul-97	08487428	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
03-Jul-97	08488438	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
07-Jul-97	08446579	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
07-Jul-97	08446579	SMALL	CLAIMS IN EXCESS OF 20	$ 11.00
07-Jul-97	08470476	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
07-Jul-97	08470476	LARGE	CLAIMS IN EXCESS OF 20	$ 44.00
07-Jul-97	08474139	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
07-Jul-97	08474146	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
07-Jul-97	08474674	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00

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07-Jul-97	08478044	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
07-Jul-97	08487536	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
07-Jul-97	08487536	LARGE	CLAIMS IN EXCESS OF 20	$ 22.00
07-Jul-97	08487536	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 80.00
08-Jul-97	08438659	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
08-Jul-97	08442327	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
08-Jul-97	08446430	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
08-Jul-97	08446430	LARGE	CLAIMS IN EXCESS OF 20	$ 110.00
08-Jul-97	08447448	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
08-Jul-97	08471191	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
08-Jul-97	08473213	UNKNOWN	REPLENISHMENT	$ (27.00)
08-Jul-97	08474963	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
08-Jul-97	08478663	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
08-Jul-97	08480060	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
08-Jul-97	08480060	LARGE	CLAIMS IN EXCESS OF 20	$ 286.00
08-Jul-97	08487410	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
08-Jul-97	08487410	LARGE	CLAIMS IN EXCESS OF 20	$ 132.00
08-Jul-97	08487982	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
08-Jul-97	08487984	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
09-Jul-97	08444643	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
09-Jul-97	08477711	UNKNOWN	REPLENISHMENT	$ (242.00)
14-Jul-97	08473998	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
17-Jul-97	08447414	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
17-Jul-97	08447414	LARGE	CLAIMS IN EXCESS OF 20	$ 22.00
17-Jul-97	08447414	LARGE	PETITION TO REVIVE UNAVOIDABLY ABANDONED APPLICATION	$ 110.00
17-Jul-97	08447414	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ (930.00)
17-Jul-97	08449800	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
21-Jul-97	08447449	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
21-Jul-97	08448644	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
22-Jul-97	08473997	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
22-Jul-97	08486266	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
23-Jul-97	08478767	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 40.00
23-Jul-97	08478767	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
24-Jul-97	08447415	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
24-Jul-97	08448667	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
24-Jul-97	08449248	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
24-Jul-97	08460713	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
24-Jul-97	08488378	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00

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24-Jul-97	08488378	SMALL	CLAIMS IN EXCESS OF 20	$ 11.00
25-Jul-97	08459521	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
25-Jul-97	08479414	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
25-Jul-97	08483980	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
25-Jul-97	08487851	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
25-Jul-97	08487851	LARGE	CLAIMS IN EXCESS OF 20	$ 616.00
28-Jul-97	08437937	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
28-Jul-97	08449281	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
28-Jul-97	08449523	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
31-Jul-97	08446124	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
31-Jul-97	08447711	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
31-Jul-97	08448810	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
31-Jul-97	08468994	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
31-Jul-97	08470054	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
31-Jul-97	08470054	LARGE	CLAIMS IN EXCESS OF 20	$ 220.00
31-Jul-97	08478858	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
31-Jul-97	08487155	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
31-Jul-97	08488619	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
01-Aug-97	08442165	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
01-Aug-97	08460766	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
01-Aug-97	08477805	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
01-Aug-97	08487408	SMALL	CLAIMS IN EXCESS OF 20	$ 11.00
01-Aug-97	08487408	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
01-Aug-97	08487980	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
04-Aug-97	08440657	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
04-Aug-97	08441821	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
04-Aug-97	08449411	SMALL	CLAIMS IN EXCESS OF 20	$ 198.00
04-Aug-97	08449411	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
04-Aug-97	08449530	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
04-Aug-97	08449702	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
04-Aug-97	08451377	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
04-Aug-97	08459218	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
04-Aug-97	08460817	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
04-Aug-97	08469056	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
04-Aug-97	08469056	LARGE	CLAIMS IN EXCESS OF 20	$ 330.00
04-Aug-97	08470448	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
04-Aug-97	08470570	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
04-Aug-97	08471239	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00

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04-Aug-97	08477570	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
04-Aug-97	08485773	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
04-Aug-97	08485775	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
05-Aug-97	08468323	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
05-Aug-97	08468323	LARGE	CLAIMS IN EXCESS OF 20	$ 22.00
06-Aug-97	08445290	SMALL	CLAIMS IN EXCESS OF 20	$ 33.00
06-Aug-97	08445290	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
06-Aug-97	08447679	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
06-Aug-97	08466887	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
06-Aug-97	08466890	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
06-Aug-97	08468324	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
06-Aug-97	08468736	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
06-Aug-97	08469059	SMALL	CLAIMS IN EXCESS OF 20	$ 22.00
06-Aug-97	08469059	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
06-Aug-97	08469078	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
06-Aug-97	08469103	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
06-Aug-97	08469517	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
06-Aug-97	08470447	SMALL	CLAIMS IN EXCESS OF 20	$ 176.00
06-Aug-97	08470447	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
06-Aug-97	08470571	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
06-Aug-97	08479042	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
06-Aug-97	08479523	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
06-Aug-97	08487546	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
07-Aug-97	08449867	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
07-Aug-97	08451203	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
07-Aug-97	08451746	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
07-Aug-97	08460793	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
07-Aug-97	08469106	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
07-Aug-97	08469108	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
07-Aug-97	08470053	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
07-Aug-97	08474147	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
07-Aug-97	08480383	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
07-Aug-97	08487516	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
11-Aug-97	08439670	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
11-Aug-97	08439670	LARGE	CLAIMS IN EXCESS OF 20	$ 110.00
11-Aug-97	08439670	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 80.00
11-Aug-97	08444781	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
11-Aug-97	08444781	SMALL	CLAIMS IN EXCESS OF 20	$ 88.00

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11-Aug-97	08447908	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
11-Aug-97	08449351	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
11-Aug-97	08449369	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
11-Aug-97	08449369	LARGE	CLAIMS IN EXCESS OF 20	$ 22.00
11-Aug-97	08449867	LARGE	CLAIMS IN EXCESS OF 20	$ 22.00
11-Aug-97	08449867	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 80.00
11-Aug-97	08449867	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
11-Aug-97	08470052	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
11-Aug-97	08470052	SMALL	CLAIMS IN EXCESS OF 20	$ 22.00
11-Aug-97	08473484	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
11-Aug-97	08473484	SMALL	CLAIMS IN EXCESS OF 20	$ 33.00
11-Aug-97	08479217	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
11-Aug-97	08480059	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
12-Aug-97	08444786	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
12-Aug-97	08448141	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
12-Aug-97	08448141	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 40.00
12-Aug-97	08487411	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
12-Aug-97	08487411	SMALL	CLAIMS IN EXCESS OF 20	$ 121.00
13-Aug-97	08447380	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
13-Aug-97	08469107	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
13-Aug-97	08470051	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
13-Aug-97	08470236	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
13-Aug-97	08487526	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
14-Aug-97	08397371	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
14-Aug-97	08446431	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
15-Aug-97	08442383	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
18-Aug-97	08486265	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
19-Aug-97	08460187	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
20-Aug-97	08447621	SMALL	CLAIMS IN EXCESS OF 20	$ 264.00
20-Aug-97	08447621	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
26-Aug-97	08466888	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
27-Aug-97	08487649	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 800.00
27-Aug-97	08487649	LARGE	CLAIMS IN EXCESS OF 20	$ 440.00
27-Aug-97	08487649	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
02-Sep-97	08439670	LARGE	CLAIMS IN EXCESS OF 20	$ 22.00
05-Sep-97	08487506	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
05-Sep-97	08487506	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 320.00
05-Sep-97	08487506	LARGE	CLAIMS IN EXCESS OF 20	$ 638.00

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08-Sep-97	08468641	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 40.00
08-Sep-97	08468641	SMALL	CLAIMS IN EXCESS OF 20	$ 231.00
08-Sep-97	08468641	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
15-Sep-97	08435758	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
16-Sep-97	08447712	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
16-Sep-97	08449351	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 720.00
16-Sep-97	08449351	LARGE	CLAIMS IN EXCESS OF 20	$ 682.00
16-Sep-97	08460120	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
18-Sep-97	08438216	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
18-Sep-97	08441575	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
18-Sep-97	08441575	SMALL	CLAIMS IN EXCESS OF 20	$ 110.00
18-Sep-97	08442335	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
18-Sep-97	08473224	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
19-Sep-97	08483174	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
19-Sep-97	08487895	SMALL	CLAIMS IN EXCESS OF 20	$ 66.00
19-Sep-97	08487895	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
19-Sep-97	08488436	SMALL	CLAIMS IN EXCESS OF 20	$ 11.00
19-Sep-97	08488436	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
22-Sep-97	08445045	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
22-Sep-97	08449263	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
22-Sep-97	08449413	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 80.00
22-Sep-97	08449413	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
22-Sep-97	08469496	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
22-Sep-97	08477712	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
22-Sep-97	08483269	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
23-Sep-97	08438011	SMALL	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 195.00
23-Sep-97	08459216	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
24-Sep-97	08448794	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
24-Sep-97	08448977	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
24-Sep-97	08449302	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
24-Sep-97	08449697	SMALL	CLAIMS IN EXCESS OF 20	$ 22.00
24-Sep-97	08449697	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
24-Sep-97	08449798	LARGE	CLAIMS IN EXCESS OF 20	$ 484.00
24-Sep-97	08449798	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
24-Sep-97	08452395	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
24-Sep-97	08452395	SMALL	CLAIMS IN EXCESS OF 20	$ 11.00
24-Sep-97	08458699	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
24-Sep-97	08459788	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 480.00

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24-Sep-97	08459788	LARGE	CLAIMS IN EXCESS OF 20	$ 220.00
24-Sep-97	08459788	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 930.00
24-Sep-97	08484865	SMALL	CLAIMS IN EXCESS OF 20	$ 154.00
24-Sep-97	08484865	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
24-Sep-97	08488439	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 465.00
29-Sep-97	08447414	UNKNOWN	REPLENISHMENT FROM PAYMENT BALANCE PROCESSING WINDOW	$ (930.00)
02-Oct-97	08473927	SMALL	CLAIMS IN EXCESS OF 20	$ 143.00
02-Oct-97	08473927	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 475.00
03-Oct-97	08437864	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 475.00
03-Oct-97	08441033	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
03-Oct-97	08441033	LARGE	CLAIMS IN EXCESS OF 20	$ 44.00
03-Oct-97	08460592	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 475.00
03-Oct-97	08471024	SMALL	CLAIMS IN EXCESS OF 20	$ 187.00
03-Oct-97	08471024	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 123.00
03-Oct-97	08471024	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 475.00
03-Oct-97	08483169	SMALL	CLAIMS IN EXCESS OF 20	$ 198.00
03-Oct-97	08483169	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 475.00
03-Oct-97	08487556	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 475.00
03-Oct-97	08487565	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 475.00
03-Oct-97	08488383	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 475.00
03-Oct-97	08498002	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 475.00
03-Oct-97	08511491	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
15-Oct-97	08445328	SMALL	CLAIMS IN EXCESS OF 20	$ 308.00
15-Oct-97	08445328	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 475.00
21-Oct-97	08435757	LARGE	CLAIMS IN EXCESS OF 20	$ 88.00
21-Oct-97	08435757	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
23-Oct-97	08483054	SMALL	CLAIMS IN EXCESS OF 20	$ 275.00
23-Oct-97	08483054	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 475.00
27-Oct-97	08440837	LARGE	CLAIMS IN EXCESS OF 20	$ 22.00
27-Oct-97	08440837	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
27-Oct-97	08441701	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 475.00
30-Oct-97	08441749	LARGE	CLAIMS IN EXCESS OF 20	$ 22.00
30-Oct-97	08441749	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
05-Nov-97	08444787	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 475.00
05-Nov-97	08460394	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
05-Nov-97	08485282	SMALL	CLAIMS IN EXCESS OF 20	$ 132.00
05-Nov-97	08485282	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 475.00
07-Nov-97	08460668	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00

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07-Nov-97	08486297	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 475.00
07-Nov-97	08486297	SMALL	CLAIMS IN EXCESS OF 20	$ 297.00
10-Nov-97	08437791	LARGE	CLAIMS IN EXCESS OF 20	$ 880.00
10-Nov-97	08437791	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
10-Nov-97	08437791	LARGE	CLAIMS IN EXCESS OF 20	$ 968.00
10-Nov-97	08437791	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 246.00
10-Nov-97	08488032	SMALL	CLAIMS IN EXCESS OF 20	$ 253.00
10-Nov-97	08488032	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 475.00
10-Nov-97	08488032	LARGE	CLAIMS IN EXCESS OF 20	$ 22.00
14-Nov-97	08447414	LARGE	PETITION TO REVIVE UNINTENTIONALLY ABANDONED APPLICATION	$ 1,320.00
14-Nov-97	08460770	LARGE	CLAIMS IN EXCESS OF 20	$ 374.00
14-Nov-97	08460770	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
17-Nov-97	08486259	SMALL	CLAIMS IN EXCESS OF 20	$ 66.00
17-Nov-97	08486259	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 475.00
24-Nov-97	08397582	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
24-Nov-97	08397582	LARGE	CLAIMS IN EXCESS OF 20	$ 220.00
26-Nov-97	08478908	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
26-Nov-97	08478908	LARGE	CLAIMS IN EXCESS OF 20	$ 550.00
08-Dec-97	08488620	SMALL	CLAIMS IN EXCESS OF 20	$ 33.00
08-Dec-97	08488620	SMALL	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 55.00
19-Dec-97	08460401	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 475.00
22-Dec-97	08469624	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 475.00
26-Jan-98	08446429	LARGE	CLAIMS IN EXCESS OF 20	$ 836.00
26-Jan-98	08446429	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 164.00
26-Jan-98	08446429	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
17-Feb-98	08460256	SMALL	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 395.00
17-Feb-98	08460256	SMALL	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 55.00
05-Mar-98	08449281	SMALL	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 395.00
05-Mar-98	08472066	SMALL	BASIC FILING FEE UTILITY	$ 395.00
05-Mar-98	08472066	SMALL	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 55.00
18-Mar-98	08449523	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
20-Mar-98	08437819	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
20-Mar-98	08437819	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
20-Mar-98	08442383	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
20-Mar-98	08447611	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
20-Mar-98	08447611	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
20-Mar-98	08448978	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
20-Mar-98	08449291	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00

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20-Mar-98	08449532	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
20-Mar-98	08451377	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
20-Mar-98	08472399	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
20-Mar-98	08472399	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
20-Mar-98	08477955	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
20-Mar-98	08477955	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
26-Mar-98	08460765	LARGE	NOTICE OF APPEAL	$ 310.00
26-Mar-98	08460765	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
30-Mar-98	08441880	LARGE	NOTICE OF APPEAL	$ 310.00
30-Mar-98	08441880	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
30-Mar-98	08446431	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
30-Mar-98	08446431	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
30-Mar-98	08447724	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
30-Mar-98	08447724	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
30-Mar-98	08447938	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
30-Mar-98	08448141	LARGE	CLAIMS IN EXCESS OF 20	$ 1,320.00
30-Mar-98	08448141	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
30-Mar-98	08448916	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
30-Mar-98	08449530	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
30-Mar-98	08479375	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
30-Mar-98	08482573	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
30-Mar-98	08482573	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
30-Mar-98	08487546	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
30-Mar-98	08487546	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
03-Apr-98	08479375	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 41.00
03-Apr-98	08486265	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
08-Apr-98	08441701	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
08-Apr-98	08444756	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
08-Apr-98	08444756	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
08-Apr-98	08447380	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
08-Apr-98	08447380	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
08-Apr-98	08447448	LARGE	BASIC FILING FEE UTILITY	$ 790.00
08-Apr-98	08447449	LARGE	BASIC FILING FEE UTILITY	$ 790.00
08-Apr-98	08447621	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
08-Apr-98	08447621	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
08-Apr-98	08449717	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
08-Apr-98	08460591	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
08-Apr-98	08479523	LARGE	BASIC FILING FEE UTILITY	$ 790.00

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08-Apr-98	08487526	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
10-Apr-98	08113329	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
27-Apr-98	08460043	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
29-Apr-98	08449411	LARGE	CLAIMS IN EXCESS OF 20	$ 176.00
01-May-98	08444757	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
01-May-98	08444757	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
01-May-98	08448099	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
01-May-98	08448099	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
01-May-98	08449110	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
01-May-98	08449110	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
01-May-98	08449302	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
01-May-98	08449302	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
01-May-98	08449531	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
01-May-98	08449531	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
01-May-98	08449702	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
01-May-98	08449800	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
01-May-98	08449800	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
01-May-98	08469626	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
01-May-98	08469626	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
01-May-98	08478107	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
01-May-98	08478107	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
01-May-98	08485282	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
05-May-98	08438206	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
06-May-98	08474496	SMALL	CLAIMS IN EXCESS OF 20	$ 33.00
06-May-98	08474496	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 475.00
11-May-98	08474496	SMALL	CLAIMS IN EXCESS OF 20	$ 11.00
14-May-98	08448309	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
14-May-98	08448309	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
15-May-98	08444643	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
15-May-98	08444643	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
19-May-98	08460743	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
19-May-98	08460743	NOT APPLICABLE	PETITIONS TO THE COMMISSIONER UNLESS OTHERWISE SPECIFIED	$ 130.00
20-May-98	08480060	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 400.00
20-May-98	08480060	LARGE	STATUTORY DISCLAIMER	$ 110.00
20-May-98	08480060	NOT APPLICABLE	SUBMISSION OF I.D.S. UNDER RULE 1.97(c)	$ 240.00
26-May-98	08458566	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 475.00
26-May-98	08458566	SMALL	CLAIMS IN EXCESS OF 20	$ 209.00
26-May-98	08458699	LARGE	CLAIMS IN EXCESS OF 20	$ 66.00

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26-May-98	08458699	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
26-May-98	08474145	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
26-May-98	08474674	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
26-May-98	08474674	LARGE	NOTICE OF APPEAL	$ 310.00
01-Jun-98	08441880	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
05-Jun-98	08437635	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
09-Jun-98	08469355	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
10-Jun-98	08484858	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
10-Jun-98	08484858	LARGE	CLAIMS IN EXCESS OF 20	$ 88.00
10-Jun-98	08484858	SMALL	CLAIMS IN EXCESS OF 20	$ 44.00
10-Jun-98	08486265	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
10-Jun-98	08486265	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
16-Jun-98	08474119	LARGE	NOTICE OF APPEAL	$ 310.00
18-Jun-98	08397371	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
18-Jun-98	08397371	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
18-Jun-98	08444787	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 400.00
18-Jun-98	08444787	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
18-Jun-98	08444887	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
18-Jun-98	08444887	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
18-Jun-98	08446430	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
18-Jun-98	08446430	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 400.00
18-Jun-98	08447414	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
18-Jun-98	08447414	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 400.00
18-Jun-98	08447502	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
18-Jun-98	08447502	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 400.00
18-Jun-98	08447679	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
18-Jun-98	08447679	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
18-Jun-98	08447726	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
18-Jun-98	08447726	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 400.00
18-Jun-98	08447826	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 400.00
18-Jun-98	08447826	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
18-Jun-98	08448833	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
18-Jun-98	08448833	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 400.00
18-Jun-98	08448917	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
18-Jun-98	08448917	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
18-Jun-98	08460401	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
18-Jun-98	08460401	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 400.00
18-Jun-98	08468641	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00

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18-Jun-98	08468641	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 400.00
18-Jun-98	08468994	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 400.00
18-Jun-98	08468994	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
18-Jun-98	08473213	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
18-Jun-98	08473213	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
18-Jun-98	08473224	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
18-Jun-98	08473224	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
18-Jun-98	08473997	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
18-Jun-98	08473997	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 400.00
18-Jun-98	08473998	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
18-Jun-98	08473998	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
18-Jun-98	08477711	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
18-Jun-98	08477711	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
18-Jun-98	08478858	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
18-Jun-98	08478858	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 400.00
18-Jun-98	08480059	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
18-Jun-98	08480059	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 400.00
18-Jun-98	08487984	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
18-Jun-98	08487984	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
19-Jun-98	08480392	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
22-Jun-98	08445045	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
22-Jun-98	08445045	LARGE	NOTICE OF APPEAL	$ 310.00
23-Jun-98	08445294	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
23-Jun-98	08445294	LARGE	NOTICE OF APPEAL	$ 310.00
23-Jun-98	08448175	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
23-Jun-98	08448175	LARGE	NOTICE OF APPEAL	$ 310.00
23-Jun-98	08448794	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 400.00
23-Jun-98	08449829	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
23-Jun-98	08449829	LARGE	NOTICE OF APPEAL	$ 310.00
25-Jun-98	08459788	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
25-Jun-98	08459788	LARGE	NOTICE OF APPEAL	$ 310.00
25-Jun-98	08460766	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
25-Jun-98	08460766	LARGE	NOTICE OF APPEAL	$ 310.00
26-Jun-98	08439668	NOT APPLICABLE	PETITIONS TO THE COMMISSIONER UNLESS OTHERWISE SPECIFIED	$ 130.00
26-Jun-98	08460677	SMALL	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 55.00
26-Jun-98	08478767	SMALL	STATUTORY DISCLAIMER	$ 55.00
02-Jul-98	08445328	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
02-Jul-98	08469612	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00

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02-Jul-98	08477570	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
02-Jul-98	08487536	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
02-Jul-98	08498002	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
02-Jul-98	08511491	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
06-Jul-98	08437937	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
06-Jul-98	08437937	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
06-Jul-98	08441033	LARGE	NOTICE OF APPEAL	$ 310.00
06-Jul-98	08441033	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
06-Jul-98	08446494	LARGE	NOTICE OF APPEAL	$ 310.00
06-Jul-98	08446494	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 400.00
06-Jul-98	08447415	LARGE	NOTICE OF APPEAL	$ 310.00
06-Jul-98	08447415	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
06-Jul-98	08448143	LARGE	NOTICE OF APPEAL	$ 310.00
06-Jul-98	08448143	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
06-Jul-98	08448976	LARGE	NOTICE OF APPEAL	$ 310.00
06-Jul-98	08448976	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 400.00
06-Jul-98	08460240	LARGE	NOTICE OF APPEAL	$ 310.00
06-Jul-98	08460240	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
06-Jul-98	08460556	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
06-Jul-98	08469103	LARGE	NOTICE OF APPEAL	$ 310.00
06-Jul-98	08469103	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
06-Jul-98	08472462	LARGE	NOTICE OF APPEAL	$ 310.00
06-Jul-98	08472462	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
06-Jul-98	08473484	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
06-Jul-98	08479215	LARGE	NOTICE OF APPEAL	$ 310.00
06-Jul-98	08479215	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 400.00
06-Jul-98	08479216	LARGE	NOTICE OF APPEAL	$ 310.00
06-Jul-98	08479216	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
06-Jul-98	08479414	LARGE	NOTICE OF APPEAL	$ 310.00
06-Jul-98	08479414	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
06-Jul-98	08483169	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
06-Jul-98	08487556	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
06-Jul-98	08487556	LARGE	CLAIMS IN EXCESS OF 20	$ 484.00
06-Jul-98	08487556	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 82.00
06-Jul-98	08487556	LARGE	CLAIMS IN EXCESS OF 20	$ 484.00
06-Jul-98	08487556	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 82.00
06-Jul-98	08487556	LARGE	CLAIMS IN EXCESS OF 20	$ 484.00
06-Jul-98	08487556	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 82.00

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07-Jul-98	08487982	LARGE	NOTICE OF APPEAL	$ 310.00
07-Jul-98	08487982	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
08-Jul-98	08488383	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
08-Jul-98	08488383	LARGE	CLAIMS IN EXCESS OF 20	$ 704.00
13-Jul-98	08447908	LARGE	NOTICE OF APPEAL	$ 310.00
13-Jul-98	08447908	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
13-Jul-98	08477564	LARGE	NOTICE OF APPEAL	$ 310.00
13-Jul-98	08477564	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
13-Jul-98	08479374	LARGE	NOTICE OF APPEAL	$ 310.00
13-Jul-98	08479374	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
13-Jul-98	08487408	LARGE	NOTICE OF APPEAL	$ 310.00
13-Jul-98	08487408	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
14-Jul-98	08480060	NOT APPLICABLE	RECORDING EACH PATENT ASSIGNMENT, AGREEMENT, OR OTHER PAPER, PER PROPERTY	$ 40.00
15-Jul-98	08448667	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
16-Jul-98	08441821	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
16-Jul-98	08446124	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 400.00
16-Jul-98	08446124	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
16-Jul-98	08448794	LARGE	NOTICE OF APPEAL	$ 310.00
16-Jul-98	08448794	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
16-Jul-98	08448977	LARGE	NOTICE OF APPEAL	$ 310.00
16-Jul-98	08448977	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
16-Jul-98	08449697	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
16-Jul-98	08449697	LARGE	CLAIMS IN EXCESS OF 20	$ 484.00
16-Jul-98	08459506	LARGE	NOTICE OF APPEAL	$ 310.00
16-Jul-98	08459506	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 400.00
16-Jul-98	08460240	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
16-Jul-98	08480060	LARGE	UTILITY ISSUE FEE	$ 1,320.00
16-Jul-98	08480060	NOT APPLICABLE	PRINTED COPY OF PATENT W/O COLOR, REGULAR SERVICE	$ 30.00
16-Jul-98	08482857	LARGE	NOTICE OF APPEAL	$ 310.00
16-Jul-98	08482857	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
16-Jul-98	08488620	LARGE	NOTICE OF APPEAL	$ 310.00
16-Jul-98	08488620	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
21-Jul-98	08449248	LARGE	NOTICE OF APPEAL	$ 310.00
21-Jul-98	08449248	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
21-Jul-98	08487428	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 400.00
22-Jul-98	08446553	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
24-Jul-98	08442327	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 400.00
24-Jul-98	08483054	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 400.00

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27-Jul-98	08441942	LARGE	CLAIMS IN EXCESS OF 20	$ 286.00
27-Jul-98	08441942	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
27-Jul-98	08447712	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
27-Jul-98	08466894	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
27-Jul-98	08487155	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
29-Jul-98	08438216	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
29-Jul-98	08438216	LARGE	STATUTORY DISCLAIMER	$ 110.00
29-Jul-98	08438216	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ (110.00)
29-Jul-98	08438216	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
29-Jul-98	08444788	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
29-Jul-98	08444788	LARGE	STATUTORY DISCLAIMER	$ 110.00
29-Jul-98	08448644	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
29-Jul-98	08448644	LARGE	STATUTORY DISCLAIMER	$ 110.00
29-Jul-98	08484858	LARGE	STATUTORY DISCLAIMER	$ 110.00
29-Jul-98	08485283	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
29-Jul-98	08485283	LARGE	STATUTORY DISCLAIMER	$ 110.00
29-Jul-98	08487536	LARGE	STATUTORY DISCLAIMER	$ 110.00
30-Jul-98	08441575	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
31-Jul-98	08442369	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 400.00
03-Aug-98	08438216	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
03-Aug-98	08438216	LARGE	NOTICE OF APPEAL	$ 310.00
03-Aug-98	08444788	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
03-Aug-98	08444788	LARGE	NOTICE OF APPEAL	$ 310.00
03-Aug-98	08447974	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
03-Aug-98	08460081	LARGE	CLAIMS IN EXCESS OF 20	$ 198.00
03-Aug-98	08460081	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
03-Aug-98	08470054	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
03-Aug-98	08470054	LARGE	NOTICE OF APPEAL	$ 310.00
03-Aug-98	08480383	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
03-Aug-98	08485283	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
03-Aug-98	08485283	LARGE	NOTICE OF APPEAL	$ 310.00
03-Aug-98	08487410	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
05-Aug-98	08448644	LARGE	NOTICE OF APPEAL	$ 310.00
05-Aug-98	08448644	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
05-Aug-98	08449263	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
05-Aug-98	08449263	SMALL	CLAIMS IN EXCESS OF 20	$ 44.00
06-Aug-98	08441577	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
13-Aug-98	08441033	LARGE	STATUTORY DISCLAIMER	$ 110.00

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13-Aug-98	08447415	LARGE	STATUTORY DISCLAIMER	$ 110.00
13-Aug-98	08472980	LARGE	STATUTORY DISCLAIMER	$ 110.00
13-Aug-98	08472980	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
13-Aug-98	08478767	LARGE	STATUTORY DISCLAIMER	$ 110.00
13-Aug-98	08478767	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 400.00
13-Aug-98	08483054	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 400.00
13-Aug-98	08483054	LARGE	STATUTORY DISCLAIMER	$ 110.00
13-Aug-98	08488438	LARGE	STATUTORY DISCLAIMER	$ 110.00
13-Aug-98	08488438	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 400.00
17-Aug-98	08397636	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
17-Aug-98	08445294	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
17-Aug-98	08447529	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
17-Aug-98	08447529	LARGE	NOTICE OF APPEAL	$ 310.00
17-Aug-98	08447977	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
17-Aug-98	08447977	LARGE	NOTICE OF APPEAL	$ 310.00
17-Aug-98	08449369	LARGE	NOTICE OF APPEAL	$ 310.00
17-Aug-98	08449369	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
17-Aug-98	08452395	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
17-Aug-98	08467045	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 400.00
17-Aug-98	08467045	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
17-Aug-98	08468736	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 400.00
17-Aug-98	08468736	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
17-Aug-98	08469623	SMALL	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 200.00
17-Aug-98	08469623	SMALL	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 395.00
17-Aug-98	08469623	NOT APPLICABLE	SUBMISSION OF I.D.S. UNDER RULE 1.97(c)	$ 240.00
17-Aug-98	08470570	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 400.00
17-Aug-98	08470570	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
17-Aug-98	08478544	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
17-Aug-98	08478544	LARGE	BASIC FILING FEE UTILITY	$ 790.00
17-Aug-98	08484276	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
17-Aug-98	08484276	LARGE	BASIC FILING FEE UTILITY	$ 790.00
17-Aug-98	08487565	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
17-Aug-98	08487565	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
17-Aug-98	08487649	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
17-Aug-98	08487980	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
17-Aug-98	08487980	LARGE	BASIC FILING FEE UTILITY	$ 790.00
18-Aug-98	08448175	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
18-Aug-98	08448175	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00

DATE	SERIAL#	ENTITY	TRANSACTION AS OF JULY 15, 2000	FEE
19-Aug-98	08487397	SMALL	NOTICE OF APPEAL	$ 155.00
19-Aug-98	08487397	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 475.00
21-Aug-98	08445296	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 400.00
21-Aug-98	08445296	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
21-Aug-98	08449901	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
21-Aug-98	08449901	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
21-Aug-98	08460677	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 400.00
21-Aug-98	08460677	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
21-Aug-98	08471238	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
21-Aug-98	08471238	LARGE	STATUTORY DISCLAIMER	$ 110.00
21-Aug-98	08471238	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 290.00
24-Aug-98	08459216	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
25-Aug-98	08435757	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
25-Aug-98	08437864	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
25-Aug-98	08441575	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 400.00
25-Aug-98	08441575	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
25-Aug-98	08441749	LARGE	NOTICE OF APPEAL	$ 310.00
25-Aug-98	08441749	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
25-Aug-98	08442369	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
25-Aug-98	08442369	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
25-Aug-98	08460766	LARGE	STATUTORY DISCLAIMER	$ 110.00
25-Aug-98	08460766	UNKNOWN	SUSPENDED AMOUNTS	$ 20.00
25-Aug-98	08468736	UNKNOWN	REPLENISHMENT FROM PAYMENT BALANCE PROCESSING WINDOW	$ (200.00)
25-Aug-98	08470053	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 400.00
25-Aug-98	08470053	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
25-Aug-98	08474963	LARGE	NOTICE OF APPEAL	$ 310.00
25-Aug-98	08474963	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
25-Aug-98	08483174	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
25-Aug-98	08483174	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
25-Aug-98	08487411	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
26-Aug-98	08438216	UNKNOWN	REPLENISHMENT FROM PAYMENT BALANCE PROCESSING WINDOW	$ (110.00)
01-Sep-98	08467045	UNKNOWN	REPLENISHMENT FROM PAYMENT BALANCE PROCESSING WINDOW	$ (200.00)
01-Sep-98	08470570	UNKNOWN	REPLENISHMENT FROM PAYMENT BALANCE PROCESSING WINDOW	$ (200.00)
02-Sep-98	08459507	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
02-Sep-98	08459507	LARGE	CLAIMS IN EXCESS OF 20	$ 88.00
02-Sep-98	08459507	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 82.00
02-Sep-98	08459507	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ (950.00)
02-Sep-98	08459507	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00

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02-Sep-98	08459507	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 82.00
02-Sep-98	08459507	LARGE	CLAIMS IN EXCESS OF 20	$ 88.00
02-Sep-98	08459507	LARGE	CLAIMS IN EXCESS OF 20	$ (88.00)
02-Sep-98	08459507	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ (82.00)
02-Sep-98	08459507	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ (950.00)
02-Sep-98	08459507	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
02-Sep-98	08479216	UNKNOWN	REPLENISHMENT FROM PAYMENT BALANCE PROCESSING WINDOW	$ (88.00)
02-Sep-98	08487428	LARGE	NOTICE OF APPEAL	$ 310.00
02-Sep-98	08487428	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
03-Sep-98	08442327	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
03-Sep-98	08442327	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 480.00
03-Sep-98	08442327	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 310.00
04-Sep-98	08449413	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
04-Sep-98	08474147	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
04-Sep-98	08479042	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
04-Sep-98	08479042	LARGE	NOTICE OF APPEAL	$ 310.00
09-Sep-98	08440657	LARGE	NOTICE OF APPEAL	$ 310.00
09-Sep-98	08440657	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 400.00
09-Sep-98	08440657	LARGE	NOTICE OF APPEAL	$ (310.00)
09-Sep-98	08440657	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ (400.00)
09-Sep-98	08440657	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 475.00
09-Sep-98	08440657	SMALL	NOTICE OF APPEAL	$ 155.00
09-Sep-98	08446579	LARGE	NOTICE OF APPEAL	$ 310.00
09-Sep-98	08446579	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 400.00
09-Sep-98	08459521	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
09-Sep-98	08459522	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
09-Sep-98	08460085	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
09-Sep-98	08460817	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
09-Sep-98	08460817	LARGE	CLAIMS IN EXCESS OF 20	$ 572.00
09-Sep-98	08471238	LARGE	NOTICE OF APPEAL	$ 310.00
09-Sep-98	08471238	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 400.00
09-Sep-98	08474145	LARGE	STATUTORY DISCLAIMER	$ 110.00
09-Sep-98	08474963	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
09-Sep-98	08480392	LARGE	STATUTORY DISCLAIMER	$ 110.00
09-Sep-98	08485773	LARGE	NOTICE OF APPEAL	$ 310.00
09-Sep-98	08485773	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 400.00
09-Sep-98	08487428	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
10-Sep-98	08475342	LARGE	CLAIMS IN EXCESS OF 20	$ 418.00

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DATE	SERIAL#	ENTITY	TRANSACTION AS OF JULY 15, 2000	FEE
10-Sep-98	08475342	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 418.00
10-Sep-98	08475342	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 532.00
15-Sep-98	08474119	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
16-Sep-98	08442505	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
16-Sep-98	08442505	LARGE	NOTICE OF APPEAL	$ 310.00
16-Sep-98	08447711	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
16-Sep-98	08466888	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
16-Sep-98	08466888	LARGE	NOTICE OF APPEAL	$ 310.00
16-Sep-98	08470476	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
16-Sep-98	08470476	LARGE	NOTICE OF APPEAL	$ 310.00
16-Sep-98	08470571	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
16-Sep-98	08475341	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
16-Sep-98	08475341	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 400.00
16-Sep-98	08483054	LARGE	NOTICE OF APPEAL	$ 310.00
16-Sep-98	08483054	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 550.00
16-Sep-98	08486266	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
16-Sep-98	08486266	LARGE	NOTICE OF APPEAL	$ 310.00
18-Sep-98	08438011	LARGE	NOTICE OF APPEAL	$ 310.00
18-Sep-98	08438011	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
18-Sep-98	08449829	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
18-Sep-98	08449829	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
18-Sep-98	08460743	LARGE	NOTICE OF APPEAL	$ 310.00
18-Sep-98	08460743	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
18-Sep-98	08469103	SMALL	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 55.00
18-Sep-98	08469103	SMALL	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 395.00
18-Sep-98	08487506	LARGE	NOTICE OF APPEAL	$ 310.00
18-Sep-98	08487506	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
23-Sep-98	08479042	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
23-Sep-98	08486258	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
24-Sep-98	08437044	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 475.00
24-Sep-98	08437044	SMALL	NOTICE OF APPEAL	$ 155.00
24-Sep-98	08469109	LARGE	NOTICE OF APPEAL	$ 310.00
24-Sep-98	08469109	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
24-Sep-98	08470236	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
24-Sep-98	08470236	LARGE	NOTICE OF APPEAL	$ 310.00
24-Sep-98	08473484	LARGE	STATUTORY DISCLAIMER	$ 110.00
24-Sep-98	08475341	LARGE	NOTICE OF APPEAL	$ 310.00
24-Sep-98	08475341	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 400.00

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DATE	SERIAL#	ENTITY	TRANSACTION AS OF JULY 15, 2000		FEE
24-Sep-98	08475341	LARGE	NOTICE OF APPEAL	$	(310.00)
24-Sep-98	08475341	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$	(400.00)
24-Sep-98	08477805	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$	950.00
24-Sep-98	08477805	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$	(950.00)
24-Sep-98	08483169	LARGE	STATUTORY DISCLAIMER	$	110.00
24-Sep-98	08488032	LARGE	NOTICE OF APPEAL	$	310.00
24-Sep-98	08488032	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$	950.00
24-Sep-98	08488378	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$	950.00
24-Sep-98	08488378	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$	790.00
24-Sep-98	08488378	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$	(790.00)
24-Sep-98	08488378	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$	(950.00)
25-Sep-98	08459521	LARGE	NOTICE OF APPEAL	$	310.00
25-Sep-98	08460765	LARGE	EXTENSION FOR RESPONSE WITHIN 4TH MO.	$	1,510.00
25-Sep-98	08460765	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$	790.00
25-Sep-98	08471240	LARGE	NOTICE OF APPEAL	$	310.00
25-Sep-98	08471240	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$	950.00
25-Sep-98	08474147	LARGE	NOTICE OF APPEAL	$	310.00
25-Sep-98	08477547	LARGE	NOTICE OF APPEAL	$	310.00
25-Sep-98	08477547	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$	950.00
25-Sep-98	08483980	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$	475.00
25-Sep-98	08483980	SMALL	CLAIMS IN EXCESS OF 20	$	110.00
28-Sep-98	08442165	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$	950.00
28-Sep-98	08446432	LARGE	NOTICE OF APPEAL	$	310.00
28-Sep-98	08446432	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$	950.00
28-Sep-98	08448810	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$	950.00
28-Sep-98	08448810	LARGE	NOTICE OF APPEAL	$	310.00
29-Sep-98	08469078	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$	475.00
29-Sep-98	08469078	SMALL	CLAIMS IN EXCESS OF 20	$	22.00
29-Sep-98	08469624	SMALL	NOTICE OF APPEAL	$	155.00
29-Sep-98	08469624	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$	475.00
29-Sep-98	08470448	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$	475.00
29-Sep-98	08470448	SMALL	CLAIMS IN EXCESS OF 20	$	22.00
29-Sep-98	08470448	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$	(475.00)
29-Sep-98	08470448	SMALL	CLAIMS IN EXCESS OF 20	$	(22.00)
29-Sep-98	08470571	LARGE	NOTICE OF APPEAL	$	310.00
29-Sep-98	08478767	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$	950.00
29-Sep-98	08478767	LARGE	NOTICE OF APPEAL	$	310.00
29-Sep-98	08488438	LARGE	NOTICE OF APPEAL	$	310.00

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DATE	SERIAL#	ENTITY	TRANSACTION AS OF JULY 15, 2000	FEE
29-Sep-98	08488438	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
30-Sep-98	08437629	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 475.00
30-Sep-98	08442335	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 475.00
30-Sep-98	08442507	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
30-Sep-98	08442507	LARGE	CLAIMS IN EXCESS OF 20	$ 22.00
30-Sep-98	08444758	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
30-Sep-98	08460642	LARGE	NOTICE OF APPEAL	$ 310.00
30-Sep-98	08460642	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
30-Sep-98	08469056	LARGE	NOTICE OF APPEAL	$ 310.00
30-Sep-98	08469056	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
30-Sep-98	08469059	LARGE	NOTICE OF APPEAL	$ 310.00
30-Sep-98	08469059	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
30-Sep-98	08471239	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
30-Sep-98	08474146	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
30-Sep-98	08474146	LARGE	CLAIMS IN EXCESS OF 20	$ 220.00
30-Sep-98	08478044	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
30-Sep-98	08478044	LARGE	NOTICE OF APPEAL	$ 310.00
30-Sep-98	08478663	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
30-Sep-98	08478663	LARGE	NOTICE OF APPEAL	$ 310.00
30-Sep-98	08479667	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
30-Sep-98	08479667	LARGE	NOTICE OF APPEAL	$ 310.00
30-Sep-98	08481074	LARGE	NOTICE OF APPEAL	$ 310.00
30-Sep-98	08481074	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
01-Oct-98	08470448	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
01-Oct-98	08470448	LARGE	CLAIMS IN EXCESS OF 20	$ 462.00
02-Oct-98	08449097	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
05-Oct-98	08438659	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
05-Oct-98	08441577	LARGE	NOTICE OF APPEAL	$ 310.00
05-Oct-98	08441577	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
05-Oct-98	08459507	UNKNOWN	SUSPENDING ACCOUNT	$ 82.00
05-Oct-98	08459507	UNKNOWN	SUSPENDING ACCOUNT	$ (82.00)
05-Oct-98	08460592	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
05-Oct-98	08469496	LARGE	NOTICE OF APPEAL	$ 310.00
05-Oct-98	08469496	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
06-Oct-98	08459507	UNKNOWN	SUSPENDING ACCOUNT	$ 950.00
06-Oct-98	08473999	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
07-Oct-98	08442505	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
07-Oct-98	08445290	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00

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DATE	SERIAL#	ENTITY	TRANSACTION AS OF JULY 15, 2000	FEE
07-Oct-98	08445290	LARGE	NOTICE OF APPEAL	$ 310.00
07-Oct-98	08447529	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
07-Oct-98	08449369	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
08-Oct-98	08437629	UNKNOWN	REPLENISHMENT FROM PAYMENT BALANCE PROCESSING WINDOW	$ (475.00)
08-Oct-98	08440837	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
08-Oct-98	08440837	LARGE	NOTICE OF APPEAL	$ 310.00
08-Oct-98	08460668	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
08-Oct-98	08460668	LARGE	NOTICE OF APPEAL	$ 310.00
08-Oct-98	08474964	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
08-Oct-98	08474964	LARGE	NOTICE OF APPEAL	$ 310.00
08-Oct-98	08487397	UNKNOWN	REPLENISHMENT FROM PAYMENT BALANCE PROCESSING WINDOW	$ (630.00)
09-Oct-98	08446123	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
09-Oct-98	08446123	LARGE	NOTICE OF APPEAL	$ 310.00
14-Oct-98	08466888	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
14-Oct-98	08469496	LARGE	MULTIPLE DEPENDENT CLAIMS	$ 270.00
14-Oct-98	08469496	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
14-Oct-98	08471024	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
14-Oct-98	08471024	LARGE	NOTICE OF APPEAL	$ 310.00
14-Oct-98	08488383	LARGE	STATUTORY DISCLAIMER	$ 110.00
14-Oct-98	08498002	LARGE	STATUTORY DISCLAIMER	$ 110.00
15-Oct-98	08442335	UNKNOWN	REPLENISHMENT FROM PAYMENT BALANCE PROCESSING WINDOW	$ (475.00)
16-Oct-98	08449697	LARGE	STATUTORY DISCLAIMER	$ 110.00
16-Oct-98	08449798	LARGE	STATUTORY DISCLAIMER	$ 110.00
16-Oct-98	08458699	LARGE	STATUTORY DISCLAIMER	$ 110.00
16-Oct-98	08459218	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
16-Oct-98	08459218	LARGE	NOTICE OF APPEAL	$ 310.00
16-Oct-98	08470476	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
20-Oct-98	08447415	NOT APPLICABLE	RECORDING EACH PATENT ASSIGNMENT, AGREEMENT, OR OTHER PAPER, PER PROPERTY	$ 40.00
20-Oct-98	08469623	UNKNOWN	REPLENISHMENT FROM PAYMENT BALANCE PROCESSING WINDOW	$ (555.00)
20-Oct-98	08470448	UNKNOWN	REPLENISHMENT FROM PAYMENT BALANCE PROCESSING WINDOW	$ (453.00)
20-Oct-98	08472980	NOT APPLICABLE	RECORDING EACH PATENT ASSIGNMENT, AGREEMENT, OR OTHER PAPER, PER PROPERTY	$ 40.00
20-Oct-98	08483980	UNKNOWN	REPLENISHMENT FROM PAYMENT BALANCE PROCESSING WINDOW	$ (365.00)
20-Oct-98	08484858	NOT APPLICABLE	RECORDING EACH PATENT ASSIGNMENT, AGREEMENT, OR OTHER PAPER, PER PROPERTY	$ 40.00
20-Oct-98	08488438	NOT APPLICABLE	RECORDING EACH PATENT ASSIGNMENT, AGREEMENT, OR OTHER PAPER, PER PROPERTY	$ 40.00
21-Oct-98	08445054	LARGE	NOTICE OF APPEAL	$ 310.00
21-Oct-98	08445054	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
21-Oct-98	08448810	LARGE	UTILITY FILING FEE CONTINUATION PATENT APPLICATION (CPA)	$ 790.00
21-Oct-98	08459507	UNKNOWN	SUSPENDING ACCOUNT	$ (950.00)

DATE	SERIAL#	ENTITY	TRANSACTION AS OF JULY 15, 2000	FEE
21-Oct-98	08469103	UNKNOWN	REPLENISHMENT FROM PAYMENT BALANCE PROCESSING WINDOW	$ (450.00)
21-Oct-98	08469624	UNKNOWN	REPLENISHMENT FROM PAYMENT BALANCE PROCESSING WINDOW	$ (155.00)
21-Oct-98	08469624	UNKNOWN	REPLENISHMENT FROM PAYMENT BALANCE PROCESSING WINDOW	$ (475.00)
21-Oct-98	08474147	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
21-Oct-98	08474147	SMALL	CLAIMS IN EXCESS OF 20	$ 220.00
21-Oct-98	08474147	SMALL	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 246.00
21-Oct-98	08478044	LARGE	STATUTORY DISCLAIMER	$ 110.00
21-Oct-98	08479374	LARGE	STATUTORY DISCLAIMER	$ 110.00
21-Oct-98	08479374	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 400.00
21-Oct-98	08480740	LARGE	NOTICE OF APPEAL	$ 310.00
21-Oct-98	08480740	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
21-Oct-98	08487981	LARGE	NOTICE OF APPEAL	$ 310.00
21-Oct-98	08487981	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
23-Oct-98	08477711	LARGE	STATUTORY DISCLAIMER	$ 110.00
26-Oct-98	08468323	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
26-Oct-98	08468323	LARGE	NOTICE OF APPEAL	$ 310.00
27-Oct-98	08460256	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
27-Oct-98	08460557	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
27-Oct-98	08460557	LARGE	NOTICE OF APPEAL	$ 310.00
27-Oct-98	08472066	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 950.00
29-Oct-98	08437635	LARGE	STATUTORY DISCLAIMER	$ 110.00
29-Oct-98	08447415	LARGE	UTILITY ISSUE FEE	$ 1,320.00
29-Oct-98	08447415	NOT APPLICABLE	PRINTED COPY OF PATENT W/O COLOR, REGULAR SERVICE	$ 30.00
29-Oct-98	08459507	UNKNOWN	SUSPENDING ACCOUNT	$ 170.00
29-Oct-98	08459507	UNKNOWN	SUSPENDING ACCOUNT	$ (170.00)
29-Oct-98	08459507	UNKNOWN	SUSPENDING ACCOUNT	$ 950.00
29-Oct-98	08472980	LARGE	UTILITY ISSUE FEE	$ 1,320.00
29-Oct-98	08472980	NOT APPLICABLE	PRINTED COPY OF PATENT W/O COLOR, REGULAR SERVICE	$ 30.00
29-Oct-98	08484858	LARGE	UTILITY ISSUE FEE	$ 1,320.00
29-Oct-98	08484858	NOT APPLICABLE	PRINTED COPY OF PATENT W/O COLOR, REGULAR SERVICE	$ 30.00
29-Oct-98	08488438	LARGE	UTILITY ISSUE FEE	$ 1,320.00
29-Oct-98	08488438	NOT APPLICABLE	PRINTED COPY OF PATENT W/O COLOR, REGULAR SERVICE	$ 30.00
30-Oct-98	08460557	UNKNOWN	REPLENISHMENT FROM PAYMENT BALANCE PROCESSING WINDOW	$ (30.00)
03-Nov-98	08459507	UNKNOWN	SUSPENDING ACCOUNT	$ (950.00)
03-Nov-98	08460743	UNKNOWN	REPLENISHMENT FROM PAYMENT BALANCE PROCESSING WINDOW	$ (480.00)
04-Nov-98	08479042	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00
05-Nov-98	08468323	UNKNOWN	REPLENISHMENT FROM PAYMENT BALANCE PROCESSING WINDOW	$ (30.00)
16-Nov-98	08446432	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 790.00

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DATE	SERIAL#	ENTITY	TRANSACTION AS OF JULY 15, 2000	FEE
16-Nov-98	08474674	SMALL	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 395.00
16-Nov-98	08474674	SMALL	EXTENSION FOR RESPONSE WITHIN 4TH MO.	$ 755.00
17-Nov-98	08440657	UNKNOWN	REPLENISHMENT FROM PAYMENT BALANCE PROCESSING WINDOW	$ (310.00)
18-Nov-98	08472399	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 435.00
18-Nov-98	08472399	SMALL	STATUTORY DISCLAIMER	$ 15.00
18-Nov-98	08472399	SMALL	STATUTORY DISCLAIMER	$ 40.00
19-Nov-98	08444788	LARGE	UTILITY ISSUE FEE	$ 1,210.00
19-Nov-98	08444788	NOT APPLICABLE	PRINTED COPY OF PATENT W/O COLOR, REGULAR SERVICE	$ 30.00
19-Nov-98	08444788	NOT APPLICABLE	RECORDING EACH PATENT ASSIGNMENT, AGREEMENT, OR OTHER PAPER, PER PROPERTY	$ 40.00
19-Nov-98	08470571	SMALL	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 395.00
23-Nov-98	08447415	UNKNOWN	REPLENISHMENT FROM PAYMENT BALANCE PROCESSING WINDOW	$ (40.00)
23-Nov-98	08449652	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
23-Nov-98	08471024	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 30.00
23-Nov-98	08471024	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00
23-Nov-98	08472980	UNKNOWN	REPLENISHMENT FROM PAYMENT BALANCE PROCESSING WINDOW	$ (40.00)
23-Nov-98	08484858	UNKNOWN	REPLENISHMENT FROM PAYMENT BALANCE PROCESSING WINDOW	$ (40.00)
23-Nov-98	08488438	UNKNOWN	REPLENISHMENT FROM PAYMENT BALANCE PROCESSING WINDOW	$ (40.00)
24-Nov-98	08441701	SMALL	STATUTORY DISCLAIMER	$ 55.00
30-Nov-98	08442383	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 435.00
30-Nov-98	08445054	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 30.00
30-Nov-98	08445054	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00
30-Nov-98	08447621	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
30-Nov-98	08460711	SMALL	NOTICE OF APPEAL	$ 150.00
30-Nov-98	08460711	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 435.00
30-Nov-98	08478794	LARGE	NOTICE OF APPEAL	$ 300.00
30-Nov-98	08478794	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
30-Nov-98	08487981	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 30.00
30-Nov-98	08487981	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00
04-Dec-98	08477955	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
07-Dec-98	08440837	SMALL	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 15.00
07-Dec-98	08440837	SMALL	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 380.00
07-Dec-98	08451377	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
07-Dec-98	08487506	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 410.00
07-Dec-98	08487506	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 380.00
09-Dec-98	08437044	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
09-Dec-98	08437044	LARGE	STATUTORY DISCLAIMER	$ 110.00
09-Dec-98	08441577	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00
09-Dec-98	08441577	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00

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DATE	SERIAL#	ENTITY	TRANSACTION AS OF JULY 15, 2000	FEE
09-Dec-98	08449532	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
09-Dec-98	08459521	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00
09-Dec-98	08459521	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
09-Dec-98	08469109	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
09-Dec-98	08469109	LARGE	STATUTORY DISCLAIMER	$ 110.00
09-Dec-98	08474139	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
09-Dec-98	08488378	LARGE	STATUTORY DISCLAIMER	$ 110.00
10-Dec-98	8437044	UNKNOWN	REPLENISHMENT FROM PAYMENT BALANCE PROCESSING WINDOW	$ (630.00)
10-Dec-98	08441701	UNKNOWN	REPLENISHMENT FROM PAYMENT BALANCE PROCESSING WINDOW	$ (55.00)
10-Dec-98	08442383	UNKNOWN	REPLENISHMENT FROM PAYMENT BALANCE PROCESSING WINDOW	$ (435.00)
10-Dec-98	08470571	UNKNOWN	REPLENISHMENT FROM PAYMENT BALANCE PROCESSING WINDOW	$ (395.00)
10-Dec-98	08474674	UNKNOWN	REPLENISHMENT FROM PAYMENT BALANCE PROCESSING WINDOW	$ (1,190.00)
14-Dec-98	08449523	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
14-Dec-98	08479523	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
16-Dec-98	08447938	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
22-Dec-98	08445045	LARGE	EXTENSION FOR RESPONSE WITHIN 4TH MO.	$ 1,360.00
22-Dec-98	08445045	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00
22-Dec-98	08447611	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
23-Dec-98	08441996	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
23-Dec-98	08447380	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
24-Dec-98	08449281	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
24-Dec-98	08449291	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
24-Dec-98	08449291	LARGE	CLAIMS IN EXCESS OF 20	$ 396.00
24-Dec-98	08449411	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
24-Dec-98	08449411	LARGE	NOTICE OF APPEAL	$ 300.00
28-Dec-98	08459788	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00
28-Dec-98	08459788	LARGE	EXTENSION FOR RESPONSE WITHIN 4TH MO.	$ 150.00
28-Dec-98	08459788	LARGE	EXTENSION FOR RESPONSE WITHIN 4TH MO.	$ 1,360.00
28-Dec-98	08459788	LARGE	EXTENSION FOR RESPONSE WITHIN 4TH MO.	$ 150.00
28-Dec-98	08460766	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00
28-Dec-98	08460766	LARGE	EXTENSION FOR RESPONSE WITHIN 4TH MO.	$ 150.00
28-Dec-98	08460766	LARGE	EXTENSION FOR RESPONSE WITHIN 4TH MO.	$ 1,360.00
29-Dec-98	08487526	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
06-Jan-99	08437819	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
06-Jan-99	08446494	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00
06-Jan-99	08446494	LARGE	EXTENSION FOR RESPONSE WITHIN 4TH MO.	$ 1,360.00
06-Jan-99	08448143	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00
06-Jan-99	08448143	LARGE	EXTENSION FOR RESPONSE WITHIN 4TH MO.	$ 1,360.00

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06-Jan-99	08448976	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00
06-Jan-99	08448976	LARGE	EXTENSION FOR RESPONSE WITHIN 4TH MO.	$ 1,360.00
06-Jan-99	08449530	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
06-Jan-99	08472462	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00
06-Jan-99	08472462	LARGE	EXTENSION FOR RESPONSE WITHIN 4TH MO.	$ 1,360.00
06-Jan-99	08479215	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00
06-Jan-99	08479215	LARGE	EXTENSION FOR RESPONSE WITHIN 4TH MO.	$ 1,360.00
06-Jan-99	08479216	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00
06-Jan-99	08479216	LARGE	EXTENSION FOR RESPONSE WITHIN 4TH MO.	$ 1,360.00
06-Jan-99	08479414	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00
06-Jan-99	08479414	LARGE	EXTENSION FOR RESPONSE WITHIN 4TH MO.	$ 1,360.00
06-Jan-99	08487982	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00
06-Jan-99	08487982	LARGE	EXTENSION FOR RESPONSE WITHIN 4TH MO.	$ 1,360.00
07-Jan-99	08447724	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
07-Jan-99	08482573	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
07-Jan-99	08485507	LARGE	NOTICE OF APPEAL	$ 300.00
07-Jan-99	08485507	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
11-Jan-99	08470052	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
11-Jan-99	08470052	LARGE	NOTICE OF APPEAL	$ 300.00
13-Jan-99	08447908	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00
13-Jan-99	08447908	LARGE	EXTENSION FOR RESPONSE WITHIN 4TH MO.	$ 1,360.00
13-Jan-99	08477564	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00
13-Jan-99	08477564	LARGE	EXTENSION FOR RESPONSE WITHIN 4TH MO.	$ 1,360.00
13-Jan-99	08479374	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00
13-Jan-99	08479374	LARGE	EXTENSION FOR RESPONSE WITHIN 4TH MO.	$ 1,360.00
13-Jan-99	08487408	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00
13-Jan-99	08487408	LARGE	EXTENSION FOR RESPONSE WITHIN 4TH MO.	$ 1,360.00
19-Jan-99	08448794	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00
19-Jan-99	08448794	LARGE	EXTENSION FOR RESPONSE WITHIN 4TH MO.	$ 1,360.00
19-Jan-99	08448977	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00
19-Jan-99	08448977	LARGE	EXTENSION FOR RESPONSE WITHIN 4TH MO.	$ 1,360.00
19-Jan-99	08459506	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00
19-Jan-99	08459506	LARGE	EXTENSION FOR RESPONSE WITHIN 4TH MO.	$ 1,360.00
19-Jan-99	08482857	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00
19-Jan-99	08482857	LARGE	EXTENSION FOR RESPONSE WITHIN 4TH MO.	$ 1,360.00
19-Jan-99	08488620	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00
19-Jan-99	08488620	LARGE	EXTENSION FOR RESPONSE WITHIN 4TH MO.	$ 1,360.00
20-Jan-99	08444788	UNKNOWN	REPLENISHMENT FROM PAYMENT BALANCE PROCESSING WINDOW	$ (110.00)

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21-Jan-99	08449248	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00
21-Jan-99	08449248	LARGE	EXTENSION FOR RESPONSE WITHIN 4TH MO.	$ 1,360.00
21-Jan-99	08449702	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
21-Jan-99	08479375	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
27-Jan-99	08448141	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
27-Jan-99	08448141	LARGE	NOTICE OF APPEAL	$ 300.00
27-Jan-99	08448141	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ (870.00)
27-Jan-99	08448141	LARGE	NOTICE OF APPEAL	$ (300.00)
27-Jan-99	08448141	LARGE	NOTICE OF APPEAL	$ 300.00
27-Jan-99	08448141	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
27-Jan-99	08474496	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
01-Feb-99	08448309	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
03-Feb-99	08438216	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00
03-Feb-99	08438216	LARGE	EXTENSION FOR RESPONSE WITHIN 4TH MO.	$ 1,360.00
03-Feb-99	08470054	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00
03-Feb-99	08470054	LARGE	EXTENSION FOR RESPONSE WITHIN 4TH MO.	$ 1,360.00
03-Feb-99	08485283	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00
03-Feb-99	08485283	LARGE	EXTENSION FOR RESPONSE WITHIN 4TH MO.	$ 1,360.00
04-Feb-99	08113329	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
04-Feb-99	08444757	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
04-Feb-99	08448099	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
04-Feb-99	08449800	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
05-Feb-99	08448644	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00
05-Feb-99	08448644	LARGE	EXTENSION FOR RESPONSE WITHIN 4TH MO.	$ 1,360.00
16-Feb-99	08449302	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
17-Feb-99	08447977	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00
17-Feb-99	08447977	LARGE	EXTENSION FOR RESPONSE WITHIN 4TH MO.	$ 1,360.00
18-Feb-99	08446431	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
18-Feb-99	08460634	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
18-Feb-99	08479524	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
18-Feb-99	08479524	LARGE	NOTICE OF APPEAL	$ 300.00
18-Feb-99	08487546	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
19-Feb-99	08487397	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00
19-Feb-99	08487397	LARGE	EXTENSION FOR RESPONSE WITHIN 4TH MO.	$ 1,360.00
24-Feb-99	08460120	LARGE	NOTICE OF APPEAL	$ 300.00
24-Feb-99	08460120	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
25-Feb-99	08441749	LARGE	EXTENSION FOR RESPONSE WITHIN 4TH MO.	$ 1,360.00
25-Feb-99	08441749	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00

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25-Feb-99	08469107	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
25-Feb-99	08469107	LARGE	NOTICE OF APPEAL	$ 300.00
25-Feb-99	08482857	LARGE	UTILITY ISSUE FEE	$ 1,210.00
25-Feb-99	08482857	NOT APPLICABLE	PRINTED COPY OF PATENT W/O COLOR, REGULAR SERVICE	$ 30.00
25-Feb-99	08482857	LARGE	UTILITY ISSUE FEE	$ (1,210.00)
25-Feb-99	08482857	NOT APPLICABLE	PRINTED COPY OF PATENT W/O COLOR, REGULAR SERVICE	$ (30.00)
26-Feb-99	08444787	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
26-Feb-99	08447414	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
01-Mar-99	08448978	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
04-Mar-99	08468641	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 380.00
04-Mar-99	08470571	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 234.00
04-Mar-99	08470571	LARGE	CLAIMS IN EXCESS OF 20	$ 1,314.00
08-Mar-99	08437044	SMALL	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 1,360.00
08-Mar-99	08437044	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00
08-Mar-99	08441701	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 624.00
08-Mar-99	08441701	LARGE	CLAIMS IN EXCESS OF 20	$ 60.00
08-Mar-99	08441701	LARGE	CLAIMS IN EXCESS OF 20	$ 714.00
08-Mar-99	08441701	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 380.00
08-Mar-99	08441701	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00
08-Mar-99	08487526	LARGE	CLAIMS IN EXCESS OF 20	$ 792.00
08-Mar-99	08487526	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 546.00
09-Mar-99	08446579	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00
09-Mar-99	08446579	LARGE	EXTENSION FOR RESPONSE WITHIN 4TH MO.	$ 1,360.00
09-Mar-99	08447712	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 468.00
09-Mar-99	08447712	LARGE	CLAIMS IN EXCESS OF 20	$ 180.00
09-Mar-99	08447712	LARGE	CLAIMS IN EXCESS OF 20	$ 360.00
09-Mar-99	08459216	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 2,886.00
09-Mar-99	08459216	LARGE	CLAIMS IN EXCESS OF 20	$ 3,168.00
09-Mar-99	08459216	LARGE	CLAIMS IN EXCESS OF 20	$ 18.00
09-Mar-99	08474964	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00
09-Mar-99	08474964	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 390.00
09-Mar-99	08474964	LARGE	CLAIMS IN EXCESS OF 20	$ 414.00
09-Mar-99	08474964	LARGE	EXTENSION FOR RESPONSE WITHIN 4TH MO.	$ 1,360.00
09-Mar-99	08480059	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
15-Mar-99	08397636	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 1,950.00
15-Mar-99	08397636	LARGE	CLAIMS IN EXCESS OF 20	$ 1,026.00
15-Mar-99	08438011	LARGE	EXTENSION FOR RESPONSE WITHIN 4TH MO.	$ 1,360.00
15-Mar-99	08438011	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00

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DATE	SERIAL#	ENTITY	TRANSACTION AS OF JULY 15, 2000	FEE
15-Mar-99	08448644	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 1,794.00
15-Mar-99	08448644	LARGE	CLAIMS IN EXCESS OF 20	$ 3,114.00
15-Mar-99	08449110	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
15-Mar-99	08449532	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 1,404.00
15-Mar-99	08449532	LARGE	CLAIMS IN EXCESS OF 20	$ 2,754.00
15-Mar-99	08449532	LARGE	MULTIPLE DEPENDENT CLAIMS	$ 260.00
15-Mar-99	08474119	LARGE	EXTENSION FOR RESPONSE WITHIN 4TH MO.	$ 1,360.00
15-Mar-99	08474119	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00
15-Mar-99	08480392	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 390.00
15-Mar-99	08480392	LARGE	CLAIMS IN EXCESS OF 20	$ 684.00
22-Mar-99	08437937	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
22-Mar-99	08444756	SMALL	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 55.00
22-Mar-99	08445328	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 702.00
22-Mar-99	08445328	LARGE	CLAIMS IN EXCESS OF 20	$ 918.00
22-Mar-99	08446124	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
22-Mar-99	08447447	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 312.00
22-Mar-99	08447447	LARGE	CLAIMS IN EXCESS OF 20	$ 360.00
22-Mar-99	08449263	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 1,092.00
22-Mar-99	08449263	LARGE	CLAIMS IN EXCESS OF 20	$ 810.00
22-Mar-99	08449281	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 2,028.00
22-Mar-99	08449281	LARGE	CLAIMS IN EXCESS OF 20	$ 2,196.00
22-Mar-99	08449530	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
22-Mar-99	08449530	LARGE	CLAIMS IN EXCESS OF 20	$ 738.00
22-Mar-99	08460556	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 78.00
22-Mar-99	08460556	LARGE	CLAIMS IN EXCESS OF 20	$ 324.00
22-Mar-99	08477805	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 1,950.00
22-Mar-99	08477805	LARGE	CLAIMS IN EXCESS OF 20	$ 1,206.00
22-Mar-99	08487536	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 1,248.00
22-Mar-99	08487536	LARGE	CLAIMS IN EXCESS OF 20	$ 1,476.00
22-Mar-99	08488439	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 624.00
22-Mar-99	08488439	LARGE	CLAIMS IN EXCESS OF 20	$ 540.00
24-Mar-99	08460817	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 1,014.00
24-Mar-99	08460817	LARGE	CLAIMS IN EXCESS OF 20	$ 1,080.00
24-Mar-99	08466894	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 3,354.00
24-Mar-99	08466894	LARGE	CLAIMS IN EXCESS OF 20	$ 3,546.00
24-Mar-99	08472066	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 312.00
24-Mar-99	08472066	LARGE	CLAIMS IN EXCESS OF 20	$ 486.00
24-Mar-99	08477547	LARGE	EXTENSION FOR RESPONSE WITHIN 4TH MO.	$ 1,360.00

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DATE	SERIAL#	ENTITY	TRANSACTION AS OF JULY 15, 2000	FEE
24-Mar-99	08477547	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00
24-Mar-99	08483169	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 390.00
24-Mar-99	08483169	LARGE	CLAIMS IN EXCESS OF 20	$ 180.00
24-Mar-99	08486258	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 2,028.00
24-Mar-99	08486258	LARGE	CLAIMS IN EXCESS OF 20	$ 2,142.00
29-Mar-99	08469612	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
29-Mar-99	08469612	LARGE	NOTICE OF APPEAL	$ 300.00
31-Mar-99	08444758	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 312.00
31-Mar-99	08444758	LARGE	CLAIMS IN EXCESS OF 20	$ 72.00
31-Mar-99	08449901	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 380.00
31-Mar-99	08452395	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 936.00
31-Mar-99	08452395	LARGE	CLAIMS IN EXCESS OF 20	$ 1,566.00
31-Mar-99	08474146	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 702.00
31-Mar-99	08474146	LARGE	CLAIMS IN EXCESS OF 20	$ 1,908.00
31-Mar-99	08475342	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 936.00
31-Mar-99	08475342	LARGE	CLAIMS IN EXCESS OF 20	$ 1,764.00
31-Mar-99	08487397	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 156.00
31-Mar-99	08487397	LARGE	CLAIMS IN EXCESS OF 20	$ 72.00
31-Mar-99	08487411	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 1,248.00
31-Mar-99	08487411	LARGE	CLAIMS IN EXCESS OF 20	$ 1,224.00
06-Apr-99	08437791	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 546.00
06-Apr-99	08437791	LARGE	CLAIMS IN EXCESS OF 20	$ 360.00
06-Apr-99	08438206	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
06-Apr-99	08438206	LARGE	NOTICE OF APPEAL	$ 300.00
06-Apr-99	08449097	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 624.00
06-Apr-99	08449097	LARGE	CLAIMS IN EXCESS OF 20	$ 954.00
06-Apr-99	08449523	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 1,794.00
06-Apr-99	08449523	LARGE	CLAIMS IN EXCESS OF 20	$ 1,260.00
06-Apr-99	08459218	LARGE	EXTENSION FOR RESPONSE WITHIN 4TH MO.	$ 1,360.00
06-Apr-99	08459218	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00
06-Apr-99	08482574	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
06-Apr-99	08482574	LARGE	NOTICE OF APPEAL	$ 300.00
06-Apr-99	08483169	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 702.00
06-Apr-99	08483169	LARGE	CLAIMS IN EXCESS OF 20	$ 396.00
06-Apr-99	08487851	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 156.00
06-Apr-99	08487851	LARGE	CLAIMS IN EXCESS OF 20	$ 360.00
07-Apr-99	08445290	LARGE	EXTENSION FOR RESPONSE WITHIN 4TH MO.	$ 1,360.00
07-Apr-99	08445290	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00

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DATE	SERIAL#	ENTITY	TRANSACTION AS OF JULY 15, 2000	FEE
09-Apr-99	08435757	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 858.00
09-Apr-99	08435757	LARGE	CLAIMS IN EXCESS OF 20	$ 630.00
09-Apr-99	08437635	LARGE	NOTICE OF APPEAL	$ 300.00
09-Apr-99	08437635	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
09-Apr-99	08437791	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
09-Apr-99	08437791	LARGE	NOTICE OF APPEAL	$ 300.00
09-Apr-99	08447496	LARGE	NOTICE OF APPEAL	$ 300.00
09-Apr-99	08447496	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 380.00
09-Apr-99	08459216	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 468.00
09-Apr-99	08459216	LARGE	CLAIMS IN EXCESS OF 20	$ 60.00
09-Apr-99	08459216	LARGE	CLAIMS IN EXCESS OF 20	$ 750.00
09-Apr-99	08459216	LARGE	CLAIMS IN EXCESS OF 20	$ 18.00
09-Apr-99	08460711	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 1,014.00
09-Apr-99	08460711	LARGE	CLAIMS IN EXCESS OF 20	$ 2,322.00
09-Apr-99	08460711	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00
09-Apr-99	08460711	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
09-Apr-99	08478794	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
09-Apr-99	08478794	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00
09-Apr-99	08485283	LARGE	CLAIMS IN EXCESS OF 20	$ 3,312.00
09-Apr-99	08485283	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 1,170.00
09-Apr-99	08485283	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 858.00
12-Apr-99	08447447	UNKNOWN	REPLENISHMENT FROM PAYMENT BALANCE PROCESSING WINDOW	$ (100.00)
16-Apr-99	08447380	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 780.00
16-Apr-99	08447380	LARGE	CLAIMS IN EXCESS OF 20	$ 900.00
16-Apr-99	08473484	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 2,184.00
16-Apr-99	08473484	LARGE	CLAIMS IN EXCESS OF 20	$ 1,800.00
16-Apr-99	08473997	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 380.00
16-Apr-99	08482857	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 234.00
16-Apr-99	08482857	LARGE	CLAIMS IN EXCESS OF 20	$ 666.00
16-Apr-99	08487526	UNKNOWN	REPLENISHMENT FROM PAYMENT BALANCE PROCESSING WINDOW	$ (1,200.00)
21-Apr-99	08485283	UNKNOWN	REPLENISHMENT FROM PAYMENT BALANCE PROCESSING WINDOW	$ (390.00)
26-Apr-99	08447679	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
30-Apr-99	08397636	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 234.00
30-Apr-99	08397636	LARGE	CLAIMS IN EXCESS OF 20	$ 810.00
30-Apr-99	08438206	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00
30-Apr-99	08447712	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 468.00
30-Apr-99	08447712	LARGE	CLAIMS IN EXCESS OF 20	$ 1,332.00
30-Apr-99	08469612	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00

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DATE	SERIAL#	ENTITY	TRANSACTION AS OF JULY 15, 2000	FEE
30-Apr-99	08479524	LARGE	EXTENSION FOR RESPONSE WITHIN 1ST MO.	$ 110.00
30-Apr-99	08479524	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00
30-Apr-99	08482574	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00
30-Apr-99	08485283	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 390.00
30-Apr-99	08485283	LARGE	CLAIMS IN EXCESS OF 20	$ 486.00
30-Apr-99	08485507	LARGE	EXTENSION FOR RESPONSE WITHIN 2ND MO.	$ 380.00
30-Apr-99	08485507	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00
30-Apr-99	08486258	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 1,092.00
30-Apr-99	08486258	LARGE	CLAIMS IN EXCESS OF 20	$ 1,566.00
12-May-99	08475341	UNKNOWN	REPLENISHMENT FROM PAYMENT BALANCE PROCESSING WINDOW	$ (710.00)
01-Jun-99	08483054	LARGE	EXTENSION FOR RESPONSE WITHIN 3RD MO.	$ 870.00
02-Jun-99	08466894	LARGE	CLAIMS IN EXCESS OF 20	$ 1,458.00
09-Jun-99	08437635	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00
09-Jun-99	08437791	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00
09-Jun-99	08447496	LARGE	FOR FILING A SUBMISSION AFTER FINAL REJECTION UNDER RULE 1.29(a)	$ 760.00
21-Jun-99	08441701	LARGE	CLAIMS IN EXCESS OF 20	$ 504.00
21-Jun-99	08441701	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 624.00
24-Jun-99	08446431	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 546.00
24-Jun-99	08446431	LARGE	CLAIMS IN EXCESS OF 20	$ 612.00
24-Jun-99	08446553	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 858.00
24-Jun-99	08446553	LARGE	CLAIMS IN EXCESS OF 20	$ 1,134.00
24-Jun-99	08487410	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 234.00
24-Jun-99	08487410	LARGE	CLAIMS IN EXCESS OF 20	$ 810.00
24-Jun-99	08487411	LARGE	CLAIMS IN EXCESS OF 20	$ 91.00
24-Jun-99	08487411	LARGE	CLAIMS IN EXCESS OF 20	$ 143.00
24-Jun-99	08488439	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 546.00
24-Jun-99	08488439	LARGE	CLAIMS IN EXCESS OF 20	$ 210.00
24-Jun-99	08488439	LARGE	CLAIMS IN EXCESS OF 20	$ 330.00
06-Jul-99	08445328	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 780.00
06-Jul-99	08445328	LARGE	CLAIMS IN EXCESS OF 20	$ 1,980.00
06-Jul-99	08448644	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 3,588.00
06-Jul-99	08448644	LARGE	CLAIMS IN EXCESS OF 20	$ 4,104.00
06-Jul-99	08459216	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 5,616.00
06-Jul-99	08459216	LARGE	CLAIMS IN EXCESS OF 20	$ 4,950.00
06-Jul-99	08460556	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 624.00
06-Jul-99	08460556	LARGE	CLAIMS IN EXCESS OF 20	$ 594.00
06-Jul-99	08487536	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 2,418.00
06-Jul-99	08487536	LARGE	CLAIMS IN EXCESS OF 20	$ 1,980.00

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DATE	SERIAL#	ENTITY	TRANSACTION AS OF JULY 15, 2000	FEE
05-Aug-99	08447415	NOT APPLICABLE	PETITIONS TO THE COMMISSIONER UNLESS OTHERWISE SPECIFIED	$ 130.00
05-Aug-99	08472980	NOT APPLICABLE	PETITIONS TO THE COMMISSIONER UNLESS OTHERWISE SPECIFIED	$ 130.00
05-Aug-99	08484858	NOT APPLICABLE	PETITIONS TO THE COMMISSIONER UNLESS OTHERWISE SPECIFIED	$ 130.00
05-Aug-99	08488438	NOT APPLICABLE	PETITIONS TO THE COMMISSIONER UNLESS OTHERWISE SPECIFIED	$ 130.00
03-Jan-00	08486258	NOT APPLICABLE	RECORDING EACH PATENT ASSIGNMENT, AGREEMENT, OR OTHER PAPER, PER PROPERTY	$ 40.00
07-Mar-00	08470571	NOT APPLICABLE	PETITIONS TO THE COMMISSIONER UNLESS OTHERWISE SPECIFIED	$ 130.00
13-Apr-00	08438216	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 312.00
13-Apr-00	08438216	LARGE	CLAIMS IN EXCESS OF 20	$ 216.00
13-Apr-00	08442383	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 468.00
13-Apr-00	08442383	LARGE	CLAIMS IN EXCESS OF 20	$ 414.00
13-Apr-00	08446494	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 780.00
13-Apr-00	08446494	LARGE	CLAIMS IN EXCESS OF 20	$ 1,170.00
13-Apr-00	08447974	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 312.00
13-Apr-00	08447974	LARGE	CLAIMS IN EXCESS OF 20	$ 378.00
13-Apr-00	08460387	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 702.00
13-Apr-00	08460387	LARGE	CLAIMS IN EXCESS OF 20	$ 1,062.00
13-Apr-00	08479374	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 312.00
13-Apr-00	08479374	LARGE	CLAIMS IN EXCESS OF 20	$ 504.00
13-Apr-00	08487851	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 312.00
13-Apr-00	08487851	LARGE	CLAIMS IN EXCESS OF 20	$ 324.00
13-Apr-00	08488378	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 780.00
13-Apr-00	08488378	LARGE	CLAIMS IN EXCESS OF 20	$ 1,404.00
08-May-00	08397636	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 4,914.00
08-May-00	08397636	LARGE	CLAIMS IN EXCESS OF 20	$ 4,446.00
08-May-00	08459521	LARGE	CLAIMS IN EXCESS OF 20	$ 450.00
08-May-00	08459521	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 936.00
08-May-00	08473484	LARGE	CLAIMS IN EXCESS OF 20	$ 2,160.00
08-May-00	08473484	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 2,028.00
08-May-00	08488383	LARGE	CLAIMS IN EXCESS OF 20	$ 1,854.00
08-May-00	08488383	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 1,326.00
09-May-00	08435757	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 2,028.00
09-May-00	08435757	LARGE	CLAIMS IN EXCESS OF 20	$ 2,700.00
09-May-00	08437791	LARGE	CLAIMS IN EXCESS OF 20	$ 504.00
09-May-00	08437791	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 780.00
09-May-00	08447712	LARGE	CLAIMS IN EXCESS OF 20	$ 972.00
09-May-00	08447712	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 546.00
09-May-00	08449263	LARGE	CLAIMS IN EXCESS OF 20	$ 1,854.00
09-May-00	08449263	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 2,652.00

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DATE	SERIAL#	ENTITY	TRANSACTION AS OF JULY 15, 2000	FEE
09-May-00	08470051	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 8,268.00
09-May-00	08470051	LARGE	CLAIMS IN EXCESS OF 20	$ 7,434.00
09-May-00	08473927	LARGE	CLAIMS IN EXCESS OF 20	$ 54.00
09-May-00	08473927	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 234.00
09-May-00	08474145	LARGE	CLAIMS IN EXCESS OF 20	$ 540.00
09-May-00	08474145	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 390.00
09-May-00	08480392	LARGE	CLAIMS IN EXCESS OF 20	$ 360.00
09-May-00	08480392	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 312.00
09-May-00	08486258	LARGE	CLAIMS IN EXCESS OF 20	$ 1,458.00
09-May-00	08486258	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 1,794.00
10-May-00	08444758	LARGE	CLAIMS IN EXCESS OF 20	$ 1,260.00
10-May-00	08444758	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 546.00
10-May-00	08447908	LARGE	CLAIMS IN EXCESS OF 20	$ 702.00
10-May-00	08447908	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 312.00
10-May-00	08448251	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 2,808.00
10-May-00	08448251	LARGE	CLAIMS IN EXCESS OF 20	$ 4,572.00
10-May-00	08449097	LARGE	CLAIMS IN EXCESS OF 20	$ 486.00
10-May-00	08449097	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 312.00
10-May-00	08449281	LARGE	CLAIMS IN EXCESS OF 20	$ 3,456.00
10-May-00	08449281	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 3,120.00
10-May-00	08449530	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 156.00
10-May-00	08449530	LARGE	CLAIMS IN EXCESS OF 20	$ 360.00
10-May-00	08452395	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 2,262.00
10-May-00	08452395	LARGE	CLAIMS IN EXCESS OF 20	$ 3,078.00
10-May-00	08459522	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 2,730.00
10-May-00	08459522	LARGE	CLAIMS IN EXCESS OF 20	$ 3,384.00
10-May-00	08460817	LARGE	CLAIMS IN EXCESS OF 20	$ 3,006.00
10-May-00	08460817	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 1,950.00
10-May-00	08472066	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 624.00
10-May-00	08472066	LARGE	CLAIMS IN EXCESS OF 20	$ 1,278.00
10-May-00	08474964	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 390.00
10-May-00	08474964	LARGE	CLAIMS IN EXCESS OF 20	$ 810.00
10-May-00	08477805	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 468.00
10-May-00	08477805	LARGE	CLAIMS IN EXCESS OF 20	$ 414.00
10-May-00	08479215	LARGE	CLAIMS IN EXCESS OF 20	$ 72.00
10-May-00	08479215	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 312.00
10-May-00	08483169	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 468.00
10-May-00	08483169	LARGE	CLAIMS IN EXCESS OF 20	$ 792.00

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DATE	SERIAL#	ENTITY	TRANSACTION AS OF JULY 15, 2000	FEE
10-May-00	08485283	LARGE	CLAIMS IN EXCESS OF 20	$ 846.00
10-May-00	08485283	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 546.00
23-May-00	08442383	LARGE	CLAIMS IN EXCESS OF 20	$ 540.00
23-May-00	08442383	LARGE	INDEPENDENT CLAIMS IN EXCESS OF 3	$ 390.00
24-May-00	07096096	UNKNOWN	MAINTENANCE FEE	$ 3,030.00
24-May-00	07096096	UNKNOWN	MAINTENANCE FEE	$ (3,030.00)
24-May-00	07588126	UNKNOWN	MAINTENANCE FEE	$ 1,430.00
24-May-00	07588126	UNKNOWN	MAINTENANCE FEE	$ (1,430.00)
24-May-00	07849226	UNKNOWN	MAINTENANCE FEE	$ 940.00
24-May-00	07849226	UNKNOWN	MAINTENANCE FEE	$ (940.00)
24-May-00	08056501	UNKNOWN	MAINTENANCE FEE	$ 1,050.00
24-May-00	08056501	UNKNOWN	MAINTENANCE FEE	$ (1,050.00)
26-May-00	06317510	UNKNOWN	MAINTENANCE FEE	$ 965.00
26-May-00	06317510	UNKNOWN	MAINTENANCE FEE	$ (965.00)
26-May-00	06829531	UNKNOWN	MAINTENANCE FEE	$ 965.00
26-May-00	06829531	UNKNOWN	MAINTENANCE FEE	$ (965.00)
26-May-00	06829531	NOT APPLICABLE	PATENT FEE CODE	$ 965.00
				$ 1,222,306.00

000418

LEVEL 1 - 3 OF 4 CASES

PERSONALIZED MASS MEDIA CORP., Plaintiff, v. THE WEATHER CHANNEL, INC., LANDMARK COMMUNICATIONS, INC., TCI OF VIRGINIA, INC., NEWPORT NEWS CABLEVISION LTD., CONTINENTAL CABLEVISION OF RICHMOND, CONTINENTAL CABLEVISION OF VIRGINIA, INC., MEDIA GENERAL CABLE OF FAIRFAX COUNTY, INC., MEDIA GENERAL CABLE OF FREDERICKSBURG, INC., COMCAST CABLEVISION OF CHESTERFIELD COUNTY, INC., SBC MEDIA VENTURES, INC., JONES INTERCABLE OF ALEXANDRIA, INC., FALCON HOLDING GROUP, L.P., ADELPHIA COMMUNICATIONS CORP., Defendants.

Civil Action No. 2:95cv242

UNITED STATES DISTRICT COURT FOR THE EASTERN DISTRICT OF VIRGINIA, NORFOLK DIVISION

899 F. Supp. 239; 1995 U.S. Dist. LEXIS 14518

September 8, 1995, Decided

September 8, 1995, Filed

CORE TERMS: patent, disqualification, prejudicial, hardship, disclosures, continuation, inequitable conduct, laches, deposition, law firm, affirmative defense, technology, infringe, patent issued, knowledgeable, distinctive, involvement, programming, invention, disclose, partner, opposing party, adverse party, witness-advocate, speculation, ethical, outset, motion to disqualify, pending litigation, particular case

COUNSEL: [**1] Attorneys for Plaintiff: Harris D. Butler, III, Charles L. Williams, William J. Pantele, Butler, Macon, Williams, Pantele & Lowndes, P.C., Richmond, Virginia. Andrew R. Shoemaker, Howrey & Simon, Washington, D.C.

Attorneys for Defendants: Conrad M. Shumadine, Walter D. Kelley, Jr., Willcox & Savage, Norfolk, Virginia. A. Stephens Clay, William H. Boice, John S. Pratt, James L. Ewing, IV, Dean W. Russell, Craig R. Kaufman, Caroline W. Spangenberg, Kilpatrick & Cody, Atlanta, Georgia.

JUDGES: Robert E. Payne, United States District Judge

OPINIONBY: Robert E. Payne

OPINION: [*240] MEMORANDUM OPINION AND ORDER

This matter is before the court on the motion of the defendant, The Weather Channel, Inc., Inc. ("TWC") to disqualify Thomas J. Scott, Jr. and Howrey & Simon, the law firm in which Scott is a partner, from serving as trial counsel to the plaintiff, Personalized Mass Media Corp. ("PMMC"). For the reasons set forth below, the motion to disqualify is granted.

STATEMENT OF FACTS

PMMC instituted this action against TWC and several other defendants alleging the infringement of three patents of which PMMC is the assignee. The patents in suit are the '825 Patent issued on October 23, 1990, [**2] the '414 Patent issued on April 28, 1992 and the '277 Patent issued on August 2, 1994. n1 It is alleged that each of the patents in suit relates back to and derives support from a patent applied for in 1981.

n1 The full descriptions of the respective patents are U.S. Patent No. *4,965,825*; U.S. Patent No. *5,109,414*; and U.S. Patent No. *5,335,277*, respectively.

The history of the patents in suit began in the late 1970s when John C. Harvey, president and principal shareholder of PMMC became interested in patenting certain ideas relating to technology of the sort here at issue. Harvey filed U.S. Patent Application

No. 317,510 (the "'510 Application") on November 3, 1981. In February 1986, PMMC filed U.S. Patent Application No. 829,531 (the "'531 Application") which was a continuation of the '510 Application. In September 1987, PMMC filed U.S. Patent Application No. 96,096 (the "'096 Application") which is alleged to be a continuation-in-part application claiming priority relating back to the '510 Application but [**3] adding new matter. The '096 Application was issued as the *'825* Patent in October 1990. On September 25, 1990, PMMC filed U.S. Patent Application No. 588,126 (the "'126 Application"), alleged to be a continuation of the '096 Application. The '126 Application was issued as the *'414* Patent in April 1992. On March 10, 1992, PMMC filed U.S. Patent Application No. 849,226 (the "'226 Application"), alleged to be a continuation of the '126 Application. On May 3, 1993, PMMC filed U.S. Patent Application No. 56,501 (the "'501 Application"), alleged to be a continuation of the '226 Application. The '501 Application issued as the '277 Patent in August 1994.

The patents in suit are alleged to control technology relating to the insertion of locally generated television images into a national television broadcast to present a national program with segments that are tailored to local viewing areas. TWC provides to cable television operators programming that includes weather forecast information, control signals and other information which the cable operator transmits to its cable subscribers. This programming requires the use of a receiver known as "Weather Star 4000" which is made, used, sold or [**4] leased by TWC to its cable operator customers.

[*241] The complaint alleges that TWC infringes the *'825* Patent, the *'414* Patent and the *'277* Patent "by providing the TWC programming, information and control signals and by making, using and selling the infringing Weather Star 4000 receiver." (Complaint, P 26). PMMC also alleges that, in so doing, TWC induces others to infringe each of the patents in suit.

TWC and the other defendants deny that they infringe PMMC's patents. Also, they assert, as affirmative defenses, that PMMC is in laches in the general equitable sense of that term and that PMMC is barred by the doctrine of laches as it is applied in patent jurisprudence. As an additional affirmative defense, TWC alleges that PMMC, alone and with Scott's assistance, has engaged in inequitable conduct which renders the patents in suit unenforceable. It is Scott's role in the prosecution of the '510 Application, the continuation applications and the patents in suit, in addition to his involvement in the business plan and strategy for enforcing PMMC's patent rights, that form the basis of TWC's motion to disqualify Scott and How[illegible] Simon.

The defense of laches raised by TWC is essentially [**5] that PMMC deliberately delayed presenting to the U.S. Patent and Trademark Office ("PTO") claims to long-known inventions so that PMMC could await the distribution of products and systems in the marketplace and then draft claims covering those products and systems. At deposition, Scott testified that each and every invention claimed in the PMMC patents since 1981 was known to Harvey at the time the '510 Application was filed in 1981. The record shows that there were lengthy delays in prosecuting the continuation applications and the patents in suit. TWC contends that documents, including PMMC's business plans and correspondence with outsiders, show that the purpose of these delays was a strategic one based on PMMC's anticipation that others would develop commercially valuable technologies which PMMC could appropriate by grafting subsequent patent claims and referencing them back to the '510 Application for priority purposes. According to TWC, this conduct invokes the bar of laches to preclude enforcement of the patents in suit. Scott's deposition and the documentary evidence used as exhibits to his deposition disclose that evidence exists to support that theory.

TWC's affirmative [**6] defense of inequitable conduct is premised principally upon the failure of PMMC and Scott to disclose prior art research and references to the PTO. On those questions, the record shows that Scott assisted Harvey and a co-inventor in developing the '510 Application and in formulating the disclosures which TWC contends to be inadequate because of the alleged failure to disclose prior art. Scott was involved in this process while employed as a lawyer with the firm of Cooper, Dunham, Clark, Griffin & Moran, during the period between the summer of 1979 and the spring of 1980. Scott left private practice to join the Justice Department as a patent attorney in May of 1980. Thereafter, it appears that Scott continued to assist Harvey in preparing the '510 Application but did not receive compensation for doing so. Instead, Scott apparently acted as a friend of Harvey's, rather than as counsel.

After Scott joined the Justice Department in 1980, Harvey retained the law firm of Darby & Darby to assist in preparing and filing the '510 Application. However, after Scott left the Justice Department in July of 1985, Harvey retained him to prosecute the applications for the patents in suit which, as [**7] explained above, are alleged to relate back to the '510 Application filed in 1981.

The evidence adduced to date raises an issue whether

certain prior art, domestic and foreign, ought to have been disclosed by PMMC and Scott in connection with the '510 Application and the continuation applications which are the bases for the patents in suit. Also, there is evidence that Scott has knowledge of, and a role in, the decisions respecting the disclosures to the PTO respecting foreign and domestic prior art. In fact, in literature prepared by PMMC for use in raising capital describes Scott's role as follows:

PATENT COUNSEL

Thomas J. Scott, a partner in the firm of Howrey & Simon is PMMC's patent counsel. He has advised John Harvey about [*242] the filing and prosecuting of the Company's patent position since the late 1970's. He is the expert on all aspects of the Company's patent position: including the disclosures on file in the U.S. Patent and Trademark Office, the disclosures associated with the Company's patent applications in Europe, Japan and elsewhere and the Company's development of its future patent prosecution strategy. He joined his current firm [**8] in mid-1990. Prior to that time he was a partner in the firm of Pennie & Edmonds and earlier senior patent litigator for the U.S. Department of Justice.

(emphasis added). This description of Scott's involvement in the prosecution of the patents at issue is not disproved by Scott's testimony at the deposition he gave in connection with the motion for disqualification or by the deposition exhibits.

Against this general background, it is appropriate to consider the controlling legal principles and the arguments of the parties respecting how those principles apply here.

DISCUSSION

Under Local Rule 7(I), the Virginia Code of Professional Responsibility ("VCPR") sets "the ethical standards relating to the practice of law in this court." The VCPR consists of Canons, Disciplinary Rules ("DRs") and Ethical Considerations ("ECs"). Canons are axiomatic norms articulating general standards of professional conduct. ECs are aspirational statements of objectives for the profession. DRs are mandatory statements of the minimum level of conduct below which no lawyer can fall without being subject to discipline. *Estate of Andrews v. United States, 804 F. Supp. 820, 823 (E.D. Va. [**9] 1992).*

This motion turns on Canon 5 which provides that "A Lawyer Should Exercise Independent Professional Judgment on Behalf of a Client." Canon 5 is implemented by DR 5-102 which is entitled "Withdrawal as Counsel When the Lawyer Becomes a Witness." DR 5-102(A) applies when, "after undertaking employment in contemplated or pending litigation, a lawyer learns or it is obvious that he or a lawyer in his firm ought to be called as a witness on behalf of his client. . . ." In that situation, the lawyer and the firm are obligated to withdraw from representation except under the three exceptional circumstances articulated in DR 5-101(B).

The motion in this action, however, is based on DR 5-102(B) which applies where "after undertaking employment in contemplated or pending litigation, a lawyer learns or it is obvious that he or a lawyer in his firm may be called as a witness other than on behalf of his client. . . ." DR 5-102(B) (emphasis added). In that instance, the lawyer "may continue the representation until it is apparent that his testimony is or may be prejudicial to his client." DR 5-102(B) (emphasis added).

Taken together, DR 5-101(B) and DR 5-102(A) and [**10] (B) comprise the "witness-advocate" rule which prohibits lawyers from serving as an advocate and a witness in the same proceeding except as explicitly permitted by the exceptions in DR 5-101(B)(1)-(3), where that subsection is applicable. The same prohibition governs disqualification of the lawyer's firm. *Estate of Andrews, 804 F. Supp. at 823.* The rule derives from the fundamental fact that the roles of advocate and witness are inconsistent, it being the function of the advocate to argue the cause of another and the role of a witness to state facts objectively. Id. In recognition of this fundamental difference in the roles of witness and advocate, the rule serves as a "prophylactic rule designed to protect the interests of the client, the adverse party, and the institutional integrity of the legal system as a whole." Id. (citations omitted).

Of course, these ethical rules and the disqualification which results from their application must be considered in perspective of the fundamental principle that a party ought to be represented by its counsel of choice if that is at all possible. Moreover, motions for disqualification under DR 5-102(B), predicated as they are upon [**11] the premise that the opposing party will call counsel for an adversary as a witness, are subject to abuse. And, there is a real risk that disqualification will be sought for tactical advantage only and not because of the ethical considerations on which the witness-advocate rule is based. [*243] See, e.g., *Shaffer v. Farm Fresh, 966 F.2d 142, 146* (4th Cir.), cert. denied, *506 U.S. 1021, 121 L. Ed. 2d 583, 113 S. Ct. 657 (1992).*

Therefore, disqualification under DR 5-102(B) must be accompanied by a showing that the testimony of the lawyer is (1) relevant; (2) necessary; and (3) is or may be prejudicial to the client whose lawyer is to be called as

a witness by the adverse party. Legal Ethics Opinion No. 1394, February 15, 1991, citing *Cottonwood Estates v. Paradise Builders, 128 Ariz. 99, 624 P.2d 296, 302 (Ariz. 1981).* The moving party bears the substantial burden of demonstrating specifically how and as to what issues in the action the prejudice exists or is likely to occur. *Lamborn v. Dittmer, 873 F.2d 522, 531 (2d Cir. 1989); Summagraphics Corp. v. Sanders Assocs., Inc., 19 U.S.P.Q.2D (BNA) 1859, 1861 (D. Conn. 1991); Tessier v. Plastic Surgery Specialists, Inc., 731 F. Supp. 724, 729 [**12] (E.D. Va. 1990); Clinton Mills, Inc. v. Alexander & Alexander, Inc., 687 F. Supp. 226 (D.S.C. 1988); Freeman v. Kulicke & Soffa Indus., Inc., 449 F. Supp. 974, 978 (E.D. Pa. 1978),* aff'd *591 F.2d 1334 (3d Cir. 1979); Rice v. Baron, 456 F. Supp. 1361, 1371 (S.D.N.Y. 1978).*

First, the record here establishes that Scott's testimony clearly is relevant within the meaning of Fed. R. Evid. 401. PMMC does not really contend otherwise.

Second, the record establishes the necessity of Scott's testimony. PMMC argues that Scott's testimony is not necessary because Harvey can testify to the same topics which would be addressed by Scott. This argument misses the mark. Scott's testimony is essential to many of the inequitable conduct issues. He is the one who allegedly failed to submit much of the relevant prior art. Harvey is not privy to Scott's unique knowledge about the reasons for his failure to submit the prior art. Further, Scott alone knows why he considered adequate the disclosures on which he advised Harvey, either as friend or as counsel. TWC is entitled to this information from Scott to help present its inequitable conduct defense.

It is not a sufficient answer, [**13] as PMMC contends, that Scott cannot now recall much about the matters as to which he is expected to testify. With further study of the documents and interviews by other counsel, Scott may, as the litigation progresses, recall more about the topics to which his testimony is expected to be addressed. In any event, many of the evidentiary points which TWC intends to elicit through Scott's testimony are referred to in documents authored by, or sent to, Scott as the patent expert described by PMMC. He reasonably should be expected to have knowledge about those documents and the topics they discuss. TWC is entitled to probe Scott's recollection on the basis of those documents either to see if that probing refreshes his recollection or to establish whether a document constitutes Scott's past recollection recorded. None of that may be done through Harvey. The court therefore has no difficulty in concluding that Scott's testimony is necessary to TWC's inequitable conduct defense.

PMMC's own literature also describes Scott as the expert on its patent strategy as well as its disclosures. This alone is sufficient to make his testimony necessary on the affirmative defense of laches.

Third, TWC [**14] has made the requisite showing on the prejudice factor. PMMC argues that TWC has failed to establish the prejudice prong of the test for disqualification because Scott's testimony to date has not been prejudicial in fact. This argument is premised on a misreading of the prejudice requirement. By its clear terms DR 5-102(B) requires a showing that the testimony "is or may be prejudicial" to the client. Whether testimony may be prejudicial is to be determined against an objective standard and, of course, may not be satisfied by mere speculation as to its effect. *Shaffer, 966 F.2d 142 at 146.*

Based upon Scott's deposition and the documents produced to date, it is clear that Scott's testimony on the affirmative defense of laches could be construed by a jury as prejudicial to PMMC. For example, Scott has testified that each and every invention claimed by PMMC since 1981 was known to Harvey at the time the '510 Application was filed. Further, as a person knowledgeable about PMMC's business strategy, Scott reasonably [*244] can be expected to know the reasons for the delays in presenting those claims in the continuation patents. Where, as here, there is evidence that the delay was deliberate, Scott's [**15] testimony could prove prejudicial to PMMC because it would offer support for TWC's position on the issue of laches.

In like fashion, Scott's testimony could be prejudicial to PMMC on the critical question of inequitable conduct. By PMMC's own admission, Scott has been involved in its patent prosecution and strategy for many years, perhaps as far back as the 1970s. According to PMMC, he is the most knowledgeable person about the disclosures on file in the PTO, the disclosures associated with the foreign patents, and the disclosures accompanying the 300 pending applications for related patents. Scott also is described by PMMC as "the expert on all aspects of the Company's patent position: including . . . the Company's development of its future patent prosecution strategy."

There is evidence that Scott had available to him information about prior art which was not timely filed in connection with the *'825* Application. If the jury were to believe that material was deliberately withheld, it would be prejudicial to PMMC because proof of such inequitable conduct would render PMMC's patents unenforceable. There is also evidence from which a jury might conclude that pertinent foreign art was [**16] likewise not disclosed and that Scott was knowledgeable about the

reasons for the nondisclosure. If that withholding was deliberate and it involved material references, the prejudice to PMMC is obvious. Evidence offered to date permits the conclusion that those issues will be litigated at trial and that Scott possesses potentially prejudicial information pertinent to their resolution. There is also potential prejudice in Scott's testimony respecting the decisions not to disclose post-1981 art in connection with later applications. The same may be said about the reasons why the Hazelwood n2 and Greenberg n3 patents were not cited or disclosed as relevant prior art in the original '510 Application made in 1981.

n2 U.S. Patent No. *4,025,851.*

n3 U.S. Patent No. *4,547,804.*

In sum, the record here establishes that some of Scott's testimony already is prejudicial to PMMC and other testimony reasonably may be characterized in that fashion without indulging in speculation or surmise. This is all that [**17] DR 5-102(B) requires and, under the circumstances, the court is confident that an appropriate showing of prejudice has been made.

Even if a lawyer's testimony were proved relevant, necessary, and prejudicial, DR 5-102(A) provides for three limited exceptions under which a lawyer may testify as a witness on behalf of his client and still continue representation of that client. The first exception permits the lawyer to testify about an uncontested matter or a matter of formality as to which no substantial evidence will be offered in opposition. DR 5-101(B)(1); *Estate of Andrews, 804 F. Supp. at 828.* The second exception permits the lawyer to testify about the nature and value of legal services rendered by the lawyer or the firm. DR 5-101(B) (2). The third exception provides that the lawyer may testify:

as to any matter, if refusal would work a substantial hardship on the client because of the distinctive value of the lawyer or his firm as counsel in the particular case.

DR 5-101(B) (3). PMMC argues that disqualification would present a substantial hardship to it and that, therefore, Scott should be permitted to testify and disqualification should be denied under [**18] this exception.

All three exceptions appear in the first instance in the rules respecting accepting employment knowing that testimony will be required on behalf of the client in DR 5-101(B), but all three exceptions are incorporated specifically by reference in DR 5-102(A). The law is less than clear whether the three exceptions enumerated in DR 5-101(B), and incorporated specifically in DR 5-102(A), are applicable when disqualification is sought under DR 5-102(B). Unlike DR 5-102(A), the three exceptions permitted by DR 5-101(B)(1)-(3) for testimony on behalf of the client are not specifically mentioned in the rule governing when the lawyer will be a witness other than on behalf of his client and [*245] it appears that the testimony may be prejudicial to the client. Compare DR 5-102(B) with DR 5-102(A).

Thus, a strict reading of DR 5-102(B) militates against a construction that the substantial hardship exception, DR 5-102(B)(3), is available when a lawyer is called by the opposing party and his testimony is or may be prejudicial to his client. Moreover, none of the cases cited by PMMC support its assertion that the substantial hardship exception applies. For example, Optyl Eyewear [**19] Fashion Int'l v. Style Cos. did not incorporate the substantial hardship exception into DR 5-102(B). Rather, the exception was only mentioned in connection with DR 5-101(B) and DR 5-102(A). *760 F.2d 1045 (9th Cir. 1985).* Likewise, Clinton Mills briefly mentions the exception in connection with DR 5-102(A) but not at all in its discussion of DR 5-102(B). *867 F. Supp. at 209.* Finally, in Summagraphics, although the court did note that the hardship to the plaintiff of retaining substitute counsel was lessened because it was aware of the possibility of disqualification from the outset of the litigation, it never suggested that "substantial hardship" was an exception under DR 5-102(B). *19 U.S.P.Q.2D at 1862.*

It is, however, unnecessary to decide that question in this action because, even if the substantial hardship exception applies, PMMC has not met it. From the outset, PMMC knew of the possibility of disqualification. Scott's testimony and PMMC's own literature make clear the extent of Scott's involvement in the applications and patents here at issue, in PMMC's patent strategy and in the events and circumstances on which TWC predicates its defenses of laches and inequitable [**20] conduct. Armed with that knowledge, PMMC, Scott and Howrey & Simon reasonably could have expected a challenge to the participation of Scott and the law firm in any litigation alleging infringement of PMMC's patents. See, e.g., *Summagraphics, 19 U.S.P.Q.2D at 1862.* Thus, PMMC cannot be heard to claim hardship now that the prospect has matured to reality.

Moreover, PMMC has incurred no legal fees in connection with the prosecution of the action to date because the law firm has agreed to undertake this representation of PMMC on a contingency basis. As such, the concerns about undue expense to which PMMC's brief alludes do not contribute in fact to any hardship on PMMC.

Furthermore, before the exception applies, the hardship must "be specifically related to the distinctive value of the lawyer as counsel in the particular case." Legal Ethics Opinion No. 1386, January 14, 1991. The record here contains nothing from which the court could conclude that the services of Scott or Howrey & Simon are distinctive within the meaning of the substantial hardship exception of DR 5-101(B) (3). To the contrary, there are a considerable number of law firms fully capable of undertaking the representation [**21] of PMMC in this action. Those lawyers will be able to consult with Scott and Howrey & Simon and the other lawyers who have been involved in the prosecution of PMMC's patents. Thus, the time and money invested by PMMC in Scott and Howrey & Simon in connection with prosecution of the patents and planning of the patent strategy will not be lost to PMMC. Accordingly, disqualification of Scott and Howrey & Simon could not be avoided under the substantial hardship exception, even if it did apply under DR 5-102(B).

For the foregoing reasons, it is apparent that Scott and his law firm, Howrey & Simon, ought to be disqualified and the motion seeking disqualification is granted.

The Clerk is directed to send a copy of this Memorandum Opinion and Order to all counsel of record.

It is so ORDERED.

Robert E. Payne

United States District Judge

Norfolk, Virginia
Date: SEP - 8 1995

capability enables a user to keep a record of what was transmitted after the transmission is terminated.

21. A series of interviews were held before prosecution began on this application. Unless identified specifically below in this part of the action, these interviews did not address the merits of any single application, but rather issues that are appropriate to all of the related "Harvey" applications.

The first interview was held on August 13, 1995. It was a personal interview. Attending were one of the applicants, Mr. Harvey, and his attorneys, Messrs. Scott and Woolston. Representing the PTO were Messrs. Godici, Yusko, Orsino, and Groody. Mr. Harvey and his attorneys were informed that because of the large number of related applications, the examination would be performed by a team of examiners. As of the August 1995 interview there existed a problem with some of the applications being charged large entity fees when applicants believed that small entity status was deserved. The PTO has referred this matter to the Office of Assistant Commissioner of Patents, specifically Hiram Bernstein, a petitions attorney. Mr. Harvey's representatives will attempt to resolve this issue through Mr.

Bernstein. At this time all of the related cases had not been received in the Group. No examination was planned until at least late October because the team members were managers, and needed to complete other end of fiscal year assignments and all employee performance ratings. The PTO requested that any amendments to the specification, other that to correct continuing status, be delayed. Mr. Harvey's representatives stated that no other amendments to the specification were actually planned. The PTO's goal will be to attempt to reduce the amount of paper passed between applicant and PTO since the cases are related and very difficult to move from cite to cite because of their size. Copies of the prior art only need to be filed once. The PTO will only send newly cited art once. Preliminary amendments are being prepared. The PTO however cautioned that the prosecution of the applications will not be delayed until applicants have filed these amendments. The PTO requested a chart establishing any relationships between cases and what parts of applicants' disclosure related blocks of cases were directed to. It was not, at this time, determined whether this chart would become part of the official file. The PTO planned to research this. It was the PTO's intent to examine related cases simultaneously. The PTO

welcomed any claim amendments to include resubmissions of all claims, whether amended or not. Mr. Harvey's representatives were informed that the issue of double patenting was expected to be a major issue.

On November 2, 1995, a telephonic interview was held between Mr. Woolston and Mr. Groody. Mr. Woolston indicated that two prior art statements were being completed, one for cases with a 1987 effective date, the other for cases with a 1981 effective date.

On November 30, 1995, a personal interview was held. Representing applicants were Messrs. Scott, Woolston, and Grabarek. Representing the PTO were Messrs. Yusko, Orsino, and Groody. The content of a simultaneously filed prior art statement was discussed. The PTO's copies of the parent files are missing the non-U.S. patents cited therein. The PTO requested copies of those prior art documents. Applicants gave the PTO a document showing which cases have already been amended. Since this document merely shows the status of any amended application, it has not been made part of the file record since that paper has no bearing on the merits of any issue before the PTO.

A second interview was held on later on November 30, 1995 between Mr. Scott and Mr. Groody. The sole topic discussed was double patenting. The discussion led to no conclusions on whether a double patenting rejections would be made in these applications. — —

An interview was held on December 6, 1995 between Mr. Scott and Mr. Groody. The discussion was directed to In re Schneller, 158 USPQ 210 (CCPA) and whether that decision will necessitate a double patenting rejection in any of these cases. Mr Scott was asked whether a terminal disclaimer could be filed in all of the 327 related cases to obviate a possible double patenting rejection in each of these cases over each other. Mr. Scott agreed to consider this.

An interview was held on December 13, 1995 between Mr. Scott and Mr. Groody regarding the terminal disclaimer question above. Mr. Scott proposed filing a terminal disclaimer in about 250 of the 327 cases over each other if the PTO would have each of the about 250 issue within 4 or 6 months of each other. Mr. Groody felt that the PTO would be unwilling to suspend prosecution in some cases just to have other related cases issue close to each other. No agreement was reached.

Two interviews were held between Mr. Scott and Mr. Groody on April 2, 1996. Mr. Scott pointed out that, in parent file 5,233,654, there had been a restriction requirement. After reviewing the file, Mr Groody indicated that there would not be a Schneller double patenting rejection made in any case based on parent patent 5,233,654 and 5,335,277. The action recently sent out in 08/113,329 would be changed to reflect this point. Mr. Scott inquired whether a terminal disclaimer, in these applications, would have to be filed for all of the four Harvey patents (4,694,490; 4,704,725; 4,965,825; 5,109,414). Mr. Groody felt that all four should be disclaimed, if applicants elect to take that approach toward overcoming the double patenting rejections, because of the requirement in terminal disclaimers concerning common ownership. Mr. Scott indicated that in parent patent 4,965,825, there had been a multiplicity rejection. Mr. Groody will order the file, but felt that rejection would not overcome the Schneller double patenting rejections since the CCPA did not list this situation as an acceptable reason to file continuing cases. The Court limited it exception to "independent and distinct" claims. Mr. Groody acknowledged that the Board of Appeals may accept the multiplicity argument, but, in the absence

of case law on this issue, he would still apply the Schneller rejections.

On June 10, 1996, Mr Scott spoke with Mr. Groody on several topics. Related case 08/397,582 has been withdrawn from issue in Group 2200, and a new action will be mailed containing a double patenting rejection under *In re Schneller*. This application will now be examiner in Group 2600. Mr. Scott questioned whether applicants can withdraw the terminal disclaimer made in 397,582. Mr. Groody was unsure of the answer, but later checked with Mr. Orsino, who informed him that MPEP 1490 controlled.

Mr. Groody still believes that 08/113,329 can be expedited at the Board. Mr. Scott can refer to the appeal brief to be filed in that case in responding to any application having a *Schneller* double patenting rejection.

A telephone interview was held on June 12, 1996 between Mr. Thomas Woolston and Marc E. Bookbinder representing the PTO. For S.N. 08/448,116, Mr. Woolston indicated that the supplemental preliminary amendment of Nov. 13, 1995 was incomplete and that a complete version of such would be filed shortly to perfect the submission as originally intended. Mr. Woolston also indicated

that he intended to file a second supplemental preliminary amendment in this case bringing the total number of claims to 37.

Mr. Bookbinder indicated that the Group would like to have a complete grouping of applications in a manner that was submitted earlier for only a portion of the total filings. Mr. Woolston stated that such a grouping was available and that he would forward it to the Group as soon as possible.

Mr. Bookbinder requested that each future amendment filed be accompanied by an electronically readable version thereof. Mr. Woolston stated that he could provide a disk to include one or more amendments made to applications as they were filed.

Mr. Woolston stated that he has reviewed actions that have been mailed and that he takes issue particularly with the double patenting rejections and the way In re Schneller has been applied. Mr. Bookbinder suggested that Mr. Woolston contact Mr. Groody of Group 2600 to discuss the particulars of the double patenting rejections since he was the author of those rejections.

On November 25, 1996, a telephone interview was held between Mr. Scott and Mr. Groody. Mr. Groody informed Mr. Scott that expedited processing at the Board for 113/329 would be arranged by the Office. No action on applicants' part was necessary.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of	:	
John C. Harvey and James W. Cuddihy	:	Group/Art Unit: 2602/348
Serial No. 08/441,701	:	Examiner
Filed May 15, 1995	:	Atty Dkt: 5634.052
For SIGNAL PROCESSING APPARATUS AND METHODS	:	

CHANGE TO LARGE ENTITY STATUS

ATTENTION: APPLICATION PROCESSING DIVISION, SPECIAL PROCESSING & CORRESPONDENCE BRANCH

Assistant Commissioner of Patents
Washington, D.C. 20231

Sir:

The present application has received small entity status. Upon review of (1) the claims as filed in the application as a result of the preliminary amendment and (2) the "field of use" clause in the application's assignee's license contract with a firm that is now a large entity, it has come to the applicants' attention that the present application requires large entity status. This error occurred in good faith during the press of work required for applicants' to meet the June 8, 1995 GATT application filing deadline. Please find enclosed recalculated fees for converting the present application from small to large entity status. Applicants respectfully request the records of the PTO be revised to indicate that the subject application should be considered the application of a large entity.

REMARKS

Applicants respectfully request that the additional filing fees submitted herewith be accepted and that the instant application be passed to the Examination Branch.

The Commissioner is hereby authorized to charge Deposit Account No. 08-3038 any insufficient funds in connection with the filing of the instant papers. ***This sheet is submitted in triplicate.***

Respectfully submitted,

Thomas J. Scott

Thomas J. Scott, Jr.
Registration No. 27,836
Attorney for Applicants

Date: October 30, 1995

HOWREY & SIMON
1299 Pennsylvania Avenue, NW
Washington, D.C. 20004
Tel: (202) 783-0800

#3

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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In re Application of			
John C. Harvey *and* James W. Cuddihy		:	Group Art Unit: 2602
Serial No.	08/469,496	:	Examiner
Filed	June 6, 1995	:	Atty Dkt: 5634.290
For	SIGNAL PROCESSING APPARATUS AND METHODS		

CHANGE TO SMALL ENTITY STATUS

Assistant Commissioner of Patents
Washington, D.C. 20231

Sir:

The present application was accorded large entity status. Small entity status is desired for the present application.

Submitted herewith is the Small Entity Declaration filed with the parent application establishing small entity status.

REMARKS

The Commissioner is hereby authorized to charge Deposit Account No. 08-3038 any insufficient funds in connection with the filing of the instant papers. *This sheet is submitted in triplicate.*

Respectfully submitted,

Thomas J. Scott, Jr.
Registration No. 27,836
Attorney for Applicants

Date: December 4, 1995
HOWREY & SIMON
1299 Pennsylvania Avenue, NW
Washington, D.C. 20004
Tel: (202) 783-0800

MAIL ROOM 10 PAT. & TM. OFF.

PATENT
Docket No. 5634/8

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): John C. Harvey, James W. Cuddihy

Serial No.: Unassigned

Filing Date: Herewith

For: Signal Processing Apparatus and Methods

Group Art Unit: Unassigned

Examiner: Unassigned

Box PATENT APPLICATION
Commissioner of Patents and Trademarks
Washington D.C. 20231

VERIFIED STATEMENT (DECLARATION)
CLAIMING SMALL ENTITY STATUS (37 C.F.R. §§ 1.9(f) & 1.27(c))
SMALL BUSINESS CONCERN

I hereby declare that I am an official of the small business concern identified below who is empowered to act on behalf of the concern:

Name of Small Business Concern: **The Personalized Mass Media Corporation**
Address: **333 East 57th Street**
New York, New York 10022

I hereby declare that the above-identified small business concern qualifies as a small business concern as defined in 13 C.F.R. § 121.12, and reproduced in 37 C.F.R. § 1.9(d), for purposes of paying reduced fees to the United States Patent and Trademark Office, in that the number of employees of the concern, including those of its affiliates, does not exceed 500 persons. For purposes of this statement, (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the persons employed on a full-time, part-time, or temporary basis during each of the pay periods of the fiscal year, and (2) concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both.

I hereby declare that rights under contract or law have been conveyed to and remain with the small business concern identified above with regard to the invention, entitled **Signal Processing Apparatus and Methods** by inventor(s) **John C. Harvey** and **James W. Cuddihy**, described in the application being filed herewith.

The rights held by the above-identified small business concern are exclusive.

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I acknowledge the duty to file, in this application, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 C.F.R. § 1.28(b))

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

MAIL ROOM MAY 17 1996 PAT. & TRADEMARK OFFICE 20

RECEIVED 96 MAY 24 AM 9:23 GROUP 260

In re Application of		:	
John C. Harvey *and* James W. Cuddihy		:	Group Art Unit 2602
Serial No.:	08/447,611	:	Examiner James Groody
Filed	May 23, 1995	:	Atty Dkt: 5634.137

For SIGNAL PROCESSING APPARATUS AND METHODS

CHANGE TO LARGE ENTITY STATUS

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

The present application has received small entity status. Upon review of (1) the claims as filed in the application as a result of the preliminary amendment and (2) the "field of use" clause in the application's assignee's license contract with a firm that is now a large entity, it has come to Applicants' attention that the present application requires large entity status. This error occurred in good faith during the press of work required for Applicants to meet the June 8, 1995 GATT application filing deadline. Please find enclosed recalculated fees for converting the present application from small to large entity status. Applicants respectfully request the records of the U.S. PTO be revised to indicate that the subject application should be considered the application of a large entity.

REMARKS

Applicants respectfully request that the additional filing fees submitted herewith be accepted and that the instant application be passed to the Examination Branch.

The Commissioner is hereby authorized to charge Deposit Account No. 08-3038 any insufficient funds in connection with the filing of the instant papers. ***This sheet is submitted in triplicate.***

Respectfully submitted,

Thomas J. Scott

Thomas J. Scott, Jr.
Registration No. 27,836
Attorney for Applicants

Date: May 17, 1996
HOWREY & SIMON
1299 Pennsylvania Avenue, NW
Washington, D.C. 20004
Tel: (202) 783-0800

000436

PATENT
Attorney Docket No. 52090.000383

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	Serial Number: 06/829,531
John C. Harvey *et al.*	Filing Date: February 14, 1986
Patent No. 4,704,725	
Issued: November 3, 1987	

For: SIGNAL PROCESSING APPARATUS AND METHODS

NOTIFICATION OF CHANGE OF STATUS AND PAYMENT OF ADDITIONAL MAINTENANCE FEE

Commissioner for Patents and Trademarks
Washington, D.C. 20231
ATTN: MAINTENANCE DIVISION

Sir:

Pursuant to 37 CFR § 1.28(c), Applicants respectfully give notification that the status of the above-referenced application as a small entity has been changed and they are not entitled to small entity status.

Applicants paid the third maintenance fee in the amount $1455.00 (small entity) on May 3, 1999. Applicants have discovered that the payment of the maintenance fee as a small entity was in error. Accordingly, Applicants enclose a $ 1455.00 check to cover payment of the deficiency between the amount of maintenance fee paid ($1455) and the amount due ($2910).

000437

PATENT
Attorney Docket No. 52090.000382

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	Serial Number: 06/317,510
John C. Harvey *et al.*	)	Filing Date: November 3, 1981
Patent No. 4,694,490	)	
Issued: September 15, 1987	)	

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For: SIGNAL PROCESSING APPARATUS AND METHODS

NOTIFICATION OF CHANGE OF STATUS AND PAYMENT OF ADDITIONAL MAINTENANCE FEE

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Commissioner for Patents and Trademarks
Washington, D.C. 20231
ATTN: MAINTENANCE DIVISION

Sir:

Pursuant to 37 CFR § 1.28(c), Applicants respectfully give notification that the status of the above-referenced application as a small entity has been changed and they are not entitled to small entity status.

05/09/2000 LBOND1 00000001 4694490
01 FC:185 1455.00 OP

Applicants paid the third maintenance fee in the amount $1455.00 (small entity) on March 15, 1999. Applicants have discovered that the payment of the maintenance fee as a small entity was in error. Accordingly, Applicants enclose a $ 1455.00 check to cover payment of the deficiency between the amount of maintenance fee paid ($1455) and the amount due ($2910).

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DAC (M, S)

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PATENT
Attorney Docket No. 52090.000392

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	Serial Number: 07/849,226
John C. Harvey *et al.*	Filing Date: March 10, 1992
Patent No. 5,233,654	
Issued: August 3, 1993	

For: SIGNAL PROCESSING APPARATUS AND METHODS

NOTIFICATION OF CHANGE OF STATUS AND PAYMENT OF ADDITIONAL MAINTENANCE FEE

RECEIVED MAY 3 0 2000 OFFICE OF PETITIONS DEPUTY A/C PATENTS

Commissioner for Patents and Trademarks
Washington, D.C. 20231
ATTN: MAINTENANCE DIVISION

RECEIVED 1 2000 PATENTS

Sir:

Pursuant to 37 CFR § 1.28(c), Applicants respectfully give notification that the status of the above-referenced application as a small entity has been changed and they are not entitled to small entity status.

Applicants paid the fourth year maintenance fee in the amount $470.00 (small entity) on January 21, 1997. Applicants have discovered that the payment of the maintenance fee as a small entity was in error. Accordingly, Applicants enclose a $470.00 check to cover payment of the deficiency between the amount of maintenance fee paid ($470.00) and the amount due ($940.00).

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/31/2000 JDOBLES 00000053 07849226 -940.00 OP
FC:699

02/2000 JFORD1 00000015 5233654 940.00 OP
FC:197

000439

The Commissioner is hereby authorized to charge or credit any overpayment to Deposit Account No. 50-0206

Respectfully submitted,

HUNTON & WILLIAMS

Dated: May 24, 2000

By: Thomas J. Scott

Thomas J. Scott
Registration No. 27,836

Hunton & Williams
1900 K Street, N.W., Suite 1200
Washington, D.C. 20006-1109
(202) 955-1500 (Telephone)
(202) 778-2201 (Facsimile)

000440

DAC Cm,

PATENT
Attorney Docket No. 52090.000393

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:
John C. Harvey *et al.*
Patent No. 5,109,414
Issued: April 28, 1992

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PATENT & TRADEMARK OFFICE

Serial Number: 07/588,126
Filing Date: September 25, 1990

For: SIGNAL PROCESSING APPARATUS AND METHODS

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NOTIFICATION OF CHANGE OF STATUS AND PAYMENT OF ADDITIONAL MAINTENANCE FEE

Commissioner for Patents and Trademarks
Washington, D.C. 20231
ATTN: MAINTENANCE DIVISION

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OFFICE OF PETITIONS
DEPUTY A/C PATENTS

Sir:

Pursuant to 37 CFR § 1.28(c), Applicants respectfully give notification that the status of the above-referenced application as a small entity has been changed and they are not entitled to small entity status.

Applicants paid the fourth year maintenance fee in the amount $480.00 (small entity) on September 26, 1995 and the eighth year maintenance fee in the amount of $950.00 on October 18, 1999. Applicants have discovered that the payment of the maintenance fee as a small entity was in error. Accordingly, Applicants enclose a $1430.00 check to cover payment of the deficiency between the amount of maintenance fees paid ($1430.00) and the amount due ($2860.00).

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06/02/2000 JBOBLES 00000084 07588126
01 FC:699 1430.00 OP

000441

PATENT
Attorney Docket No. 52090.000393

The Commissioner is hereby authorized to charge or credit any overpayment to Deposit Account No. 50-0206

Respectfully submitted,

HUNTON & WILLIAMS

Dated: May 24, 2000

By: Thomas J. Scott
Thomas J. Scott
Registration No. 27,836

Hunton & Williams
1900 K Street, N.W., Suite 1200
Washington, D.C. 20006-1109
(202) 955-1500 (Telephone)
(202) 778-2201 (Facsimile)

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REMARKS

Please accord small entity status for the above-referenced patent application properly filed under 37 C.F.R. § 1.60 and entitled to small entity status under 37 C.F.R § 1.28. 37 C.F.R § 1.28 provides that: "Applications filed under §§ 1.60 and 1.62 of this part must include a reference to a verified statement in a parent application if status as a small entity is still proper and desired." The instant application included by preliminary amendment a reference to the parent case in its entirety. The parent case, application serial number 08/113,329, contains a verified statement properly establishing small entity status and the application referenced above had small entity status at the application's filing date. Therefore, a reference to a verified statement establishing small entity status was properly included in the instant application. Please accept the properly filed small entity fee in the amount of $365.00 and pass the instant application onto the Examination branch. A copy of the Verified Statement Claiming Small Entity Status for a Small Business Concern from the parent case is submitted herewith. Small entity status is desired for the present application. Applicants request that any surcharge fee be returned.

The Commissioner is hereby authorized to charge Deposit Account No. 08-3038 any insufficient funds in connection with the filing of the instant papers. ***This sheet is submitted in triplicate.***

Respectfully submitted,

Thomas J. Scott, Jr.
Registration No. 27,836
Attorney for Applicants

Date: September 7, 1995
HOWREY & SIMON
1299 Pennsylvania Avenue, NW
Washington, D.C. 20004
Tel: (202) 783-0800

proceedings in the PTO on Applicants' remaining unallowed applications. At that meeting, Applicants' representatives provided Examiner Faile a document entitled "Analysis of PMC Application Claims by Subject Matter Categories." [The subject category analysis document is attached as Exhibit A to this Petition.] The subject matter categories in the Exhibit A document, which had been previously identified to the PTO examiners, define the claims of the Applicants' applications based on the general subject matter to which the claims are addressed. As stated above, each PMC application had its own subject matter identification which defined the specific distinct subject matter presented in that application. For organizational purposes, Applicants grouped the applications into general subject matter categories. For example, the general subject matter category designated ADVT is addressed to systems which present advertising at receiver sites and the general category designated ASIN is addressed to systems for assembling information and instructions at a receiver site. Under these general subject matter categories, each application had a specific subject matter to which its claims were addressed.

3. At the November 25, 1998 interview, Examiner Faile indicated that the PTO desired to consolidate all Applicants' applications in each of the 56 subject matter groupings into one or two applications and then to resolve collectively any remaining issues as to the pending claims under 35 U.S.C. §112 and with regard to general double patenting issues in such consolidated applications. Examiner Faile expressed the view that the claims within each subject matter category were similar such that they could be presented in one or two applications for each category. Accordingly, Examiner Faile request the consolidation of the claims and assured

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CATEGORY SUBJECT MA[illegible]	
ADVT	pre[illegible]ing advertising
ASIN	assembling information and instructions at a receiver station
ASRE	assembling records at a receiver station
BCON	broadcast routing and control of a receiver station
BUDG	presenting budget information
CHAN	processing of transmission channels that vary in composition/location, etc.
CLER	management of receiver station memory (clearing etc.) based on a broadcast
COMB	systems for combined control of transmitter and subscriber stations
DATA	moving and storing data and programming in a network
DIGI	digital television signal processing
DECR	relates to decryption of broadcast information
DOWN	relates to downloadable code and processor instructions
EMBD	control of embedding
ERRO	error correction
FANA	presenting financial analyses
FCOM	financial communications
FNAV	navigation to (e.g., finding) financial information
FNET	financial network automation
HEAD	headend and network node automation
HOST	host computer provision of information
I2CM	instruct-to combine systems
I2CR	instruct-to coordinate systems
I2GE	instruct-to generate systems
I2GR	instruct-to graphics systems
I2RE	instruct-to response systems
INTE	integrating remote with local processing and imaging
METE	metering
MICR	microprocessing control functionalities
MKTR	market research systems
MSTA	media station control (e.g., multimedia)
MSG	messaging systems
MULT	coordination of multi-channel, multimedia, multiple media
NAUT	network automation
NAVI	navigation to desired programming and signals
NCOM	certain networked communications functions
NECA	networked programming distribution capacities
NGEN	networked generation of information
OPNS	operating and programming systems
PARA	parallel and in-network processing systems
POLI	policy communications systems and presenting plans
PROB	solving problems and presenting solutions
RECO	presenting (and explaining) recommendations
REST	restoring efficient operations
RCOM	certain combinations of receiver station functionalities including in-network studio operations
SETT	in-set (e.g., converters/TVs) transmission receiver functionalities
SKIP	skipping incomplete image(s) etc.
STUD	studio operations (e.g., organizing and recording programming for playback)
SWIT	switching between broadcast and cablecast transmissions
SYNC	synchronization and coordination systems
TELE	networked presentation and response (e.g., by telecommunication/telephone) systems
TIME	receiver station processor timing control systems
TRAN	transmission station systems
VERI	verification (e.g., of proper performance)
VIEW	systems for viewer interactivity

DH Technology Inc. v. Synergystex International Inc. (CA FC) 47 USPQ2d 1865

DH Technology Inc. v. Synergystex International Inc.

U.S. Court of Appeals Federal Circuit
47 USPQ2d 1865

Decided September 1, 1998
Nos. 97-1128, -1280, -1453

Headnotes

PATENTS

1. Practice and procedure in Patent and Trademark Office -- Fees (§ 110.03)

Sole provision governing time for correction of erroneous payment of issue fee as small entity is 37 CFR 1.28, which specifically addresses correction of erroneous claim of small entity status and erroneous payment of small entity issue fee; Section 1.28(c)(2) permits patentee to correct erroneous payment of small entity issue fee at any time, provided payment of amount owing is accompanied by statement explaining how error in good faith occurred and when error was discovered, and while Section 1.28 does not limit time during which honest error may be corrected, it prevents attempts to fraudulently pay small entity issue fee while maintaining enforceable patent.

JUDICIAL PRACTICE AND PROCEDURE

2. Procedure -- Contempt; sanctions (§ 410.49)

Federal district court did not abuse its discretion by awarding patent infringement defendant its attorneys' fees and costs, associated with order to show cause, as sanction for plaintiff's failure to comply with court's order compelling production of documents, since plaintiff failed to timely produce documents at issue in response to various warnings by court, and failed to provide reason or explanation

for its lack of production.

Particular patents -- Electrical -- Laser printers

5,115,493, Jeanblanc, Hutchison, Virkus, and Johnsen, continuous laser printer for printing over page boundaries, summary judgment that patent is unenforceable vacated.

Case History and Disposition:

Appeal from the U.S. District Court for the Northern District of California, Orrick, J.; 40 USPQ2d 1754 .

Action by DH Technology Inc., now Axiohm Transaction Solutions Inc., against Synergystex International Inc. for patent infringement. Plaintiff appeals from summary judgment holding patent in suit unenforceable, and from imposition of sanction for failure to comply with discovery order, and defendant cross-appeals from summary judgment for plaintiff on defense of implied license, and from denial of its motion for award of attorneys' fees. Affirmed in part, vacated in part, and remanded.

Attorneys:

Kenneth B. Wilson, Vera M. Elson, and Jennifer A. Ochs, of Wilson, Sonsini, Goodrich & Rosati, Palo Alto, Calif., for plaintiff-appellant.

Gregory B. Wood and Albert F. Davis, of Merchant, Gould, Smith, Edell, Welter & Schmidt, Los Angeles, Calif.; Jai Ho Rho, Los Angeles, for defendant cross-appellant.

Judge:

Before Newman, Plager, and Schall, circuit judges.

Opinion Text

Opinion By:

Schall, J.

DH Technology, Inc. ("DHT") appeals from the decision of the United States District Court for the Northern District of California holding, on summary judgment in DHT's suit for patent infringement against Synergystex International, Inc. ("Synergystex"), that U.S. Patent No. 5,115,493 ("the '493

patent") is unenforceable because DHT incorrectly paid the small entity issue fee and because the statutorily-permitted time for correcting the error had passed. *See* *DH Tech., Inc. v. Synergystex Int'l, Inc.* , 937 F. Supp. 902, 903, 910, 40 USPQ2d 1754, 1755, 1761 (N.D. Cal. 1996). 1 DHT also appeals the district court's ruling requiring it to pay Synergystex's attorney's fees and costs associated with briefing an order to show cause, as a sanction for DHT's failure to comply with the district court's discovery order. *See* *id.* at 904, 40 USPQ2d at 1756-57.

Synergystex cross-appeals, challenging the district court's decision that this was not an exceptional case and that denied Synergystex's motion, made pursuant to 35 U.S.C. Section 285, for attorney's fees. *See* *DH Tech., Inc. v. Synergystex Int'l, Inc.* , No. C-92-3307 WHO, slip op. at 1, 3 (N.D. Cal. May 28,

Page 1866

1997). Synergystex also challenges the district court's decision, on summary judgment, that it did not have an implied license under the '493 patent. *See* *DH Tech., Inc. v. Synergystex Int'l, Inc.* , No. C-92-3307 WHO, slip op. at 1, 13-17, 21 (N.D. Cal. Nov. 28, 1995).

Because the district court erred in interpreting the law governing correction of the erroneous payment of the small entity issue fee, we vacate the grant of summary judgment of unenforceability and remand for further proceedings consistent with this opinion. We also vacate the district court's denial of exceptional case status and attorney's fees because the prevailing party, as that term is used in 35 U.S.C. Section 285, has yet to be determined. However, we affirm the district court's decisions concerning the imposition of sanctions and Synergystex's lack of an implied license.

BACKGROUND

I.

On August 15, 1990, Ivan M. Jeanblanc ("Jeanblanc"), Stephen E. Hutchison, Mark K. Virkus, and Ronald J. Johnsen filed U.S. Patent Application 07/567,839 ("the '839 application"), which disclosed a continuous laser printer that can print successive forms of varying lengths. On September 21, 1990, the inventors assigned the '839 application, along with two related applications, to The Identification Business, Inc. ("IBI"). At that time, Jeanblanc owned IBI, and IBI employed all of the named inventors. That same day, Jeanblanc executed a "Verified Statement (Declaration) Claiming Small Entity Status (37 CFR 1.9(f)) -- Small Business Concern," which provided:

> I hereby declare that the above identified small business concern [i.e., IBI] qualifies as a small business concern as defined in 13 CFR 121.3-18, and reproduced in 37 CFR 1.9(d), for purposes of paying reduced fees under section 41(a) and (b) of Title 35, United States Code, in that the number of employees of the concern, including those of its affiliates, does not exceed 500 persons. For purposes of this statement, (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the persons employed on a full-time, part- time or temporary basis during each of the pay periods of the fiscal year, and (2) concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both.
>
> I hereby declare that rights under contract or law have been conveyed to and remain with the small

business concern identified above [i.e., IBI] with regard to the invention. . . .

On November 2, 1990, DHT acquired IBI. DHT manufactures and sells commercial laser printers and accessories. Pursuant to the purchase agreement, by assignment, DHT acquired the '839 application. Neither the assignment from the inventors to IBI nor the assignment from IBI to DHT was recorded in the United States Patent and Trademark Office ("PTO") at that time.

On October 18, 1991, the PTO, in connection with the '839 application, issued a "Notice of Allowance and Issue Fee Due," which provided:

> *HOW TO RESPOND TO THIS NOTICE:* Review the SMALL ENTITY Status shown above.
>
> If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:
>
> A. If the Status is changed, pay twice the amount of the FEE DUE shown above and notify the Patent and Trademark Office of the change in status, or
>
> B. If the Status is the same, pay the FEE DUE shown above.

The notice showed that small entity status was claimed and that the issue fee was due by January 21, 1992. On January 10, 1992, Frank R. Agovino ("Agovino"), the attorney prosecuting the '839 application, paid the small entity issue fee ($525) on behalf of Jeanblanc. Agovino checked the box on the "Issue Fee Transmittal" sheet stating "This application is NOT assigned." The '839 application issued as the '493 patent, entitled "CONTINUOUS LASER PRINTER FOR PRINTING OVER PAGE BOUNDARIES," on May 19, 1992. 2

On August 14, 1992, Agovino sent the assignments, from the inventors to IBI and from IBI to DHT, to the PTO, with instructions to record the assignment to IBI first. The PTO recorded the assignments in the order requested, effective August 14, 1992.

II.

On August 18, 1992, DHT filed suit against Synergystex, a competitor in the continuous

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form laser printer market. On August 20, 1992, DHT filed an amended complaint alleging that Synergystex had willfully infringed, contributorily infringed, or induced infringement of the '493 patent. On October 9, 1992, Synergystex filed its answer, in which it denied infringement, alleged that the '493 patent was invalid and unenforceable on various grounds, and counterclaimed for declaratory judgment. On July 21, 1993, Synergystex moved for summary judgment that the '493 patent was invalid, that the patent was unenforceable due to inequitable conduct, and that it had not infringed the patent. On August 26, 1993, DHT moved for summary judgment on its infringement claims. In an April 14, 1994 opinion, the district court denied both parties' motions. *See* *DH Tech., Inc. v. Synergystex Int'l, Inc.* , No. C 92-3307 BAC, 1994 WL 163917, slip op. at *1, 3 (N.D. Cal. Apr. 14, 1994).

During an October 19, 1994 case management conference, Synergystex alleged, for the first time, "that the ['493] patent is invalid and unenforceable because DHT intentionally deceived the PTO by paying a small entity issue fee when DHT did not qualify as a small entity." *DH Tech.*, 937 F. Supp.

at 904, 40 USPQ2d at 1756. On February 16, 1995, the parties again moved for summary judgment on the same issues that had been previously presented, with DHT additionally moving for summary judgment on Synergystex's implied license defense. Synergystex had not pled the implied license defense in its answer to the amended complaint and did not raise the defense until September 16, 1993, nearly two months after the close of discovery. *See* *DH Tech.* , No. C-92-3307 WHO, slip op. at 13 n.4 (Nov. 28, 1995). On February 16, 1995, Synergystex moved for summary judgment that the patent was invalid and unenforceable on the ground that DHT had fraudulently paid the small entity issue fee.

In a November 28, 1995 ruling, the district court, *inter alia* , denied Synergystex's motion for summary judgment that the '493 patent was unenforceable because DHT had fraudulently paid the small entity issue fee despite not being a small entity. *See* *id.* at 1, 8, 13. The court did so because it determined, as far as the point was concerned, that genuine issues of material fact existed. *See* *id.* at 13. The district court granted DHT's motion for summary judgment on Synergystex's implied license defense on the ground that the "evidence offered by Synergystex on this defense [was] insufficient as a matter [of] law." *Id.* at 17. The court also denied the parties' motions for summary judgment on the infringement issue and granted summary judgment for DHT on certain of Synergystex's invalidity defenses. *See* *id.* at 21.

While the summary judgment motions were pending, on September 27, 1995, DHT erroneously paid the first maintenance fee for the '493 patent at the small entity rate. *See* *DH Tech.* , 937 F. Supp. at 904, 40 USPQ2d at 1756. DHT notified the PTO of the error on February 26, 1996. At that time, DHT corrected the erroneous underpayment and relinquished its claim of small entity status. The PTO accepted DHT's correction without issue, and this correction is not at issue in this appeal.

III.

On January 26, 1996, Synergystex filed a motion for leave to propound one additional discovery request relating to DHT's status as a small entity. Although the discovery cutoff date of July 15, 1993 had long past, the district court granted the request during a February 29, 1996 hearing. This oral ruling later was embodied in a March 5, 1996 order, which provided:

> 1. Defendant Synergystex is granted leave to propound a single additional discovery request upon plaintiff DHT: "Produce documents sufficient to show the number of employees of DH Technology, Inc. and its affiliates, including the full time, part time, and temporary employees, for each pay period from January 1991 to December 1995."
>
> 2. Plaintiff DHT is ordered to produce documents responsive to this request no later than 5:00 p.m., Thursday, March 7, 1996.

DH Tech., Inc. v. Synergystex Int'l, Inc. , No. C-92-3307 WHO, slip op. at 3-4 (N.D. Cal. Mar. 5, 1996). In response to the discovery request, DHT did not produce documents, but instead, at approximately 5:30 p.m., on March 7, 1996, notified Synergystex that it would make its payroll records available for review at its seven locations around the world. Synergystex moved for a finding of contempt, and, in an April 8, 1996 telephonic conference, the district court noted DHT's failure to comply with its discovery order. The district court gave DHT until April 26, 1996 to comply with its order, stating:

> You can comply by having the Plaintiff send photocopies of the relevant personnel records to

counsel by overnight mail for Friday delivery with the Defendant bearing the copying cost and delivery cost.

Or you can provide the Defendant with affidavits attesting to the exact number of

employees of DH Technology, Inc. and its affiliates, including full-time, part-time, and temporary employees for each pay period from January, 1991, to December, 1995.

In response, DHT produced a number of its payroll records, but several relevant documents still were missing. On May 7, 1996, the district court issued an order to show cause why the case should not be dismissed because of DHT's failure to comply fully with the court's order compelling the production of documents sufficient to show the number of DHT employees during the relevant periods. DHT answered by filing several declarations explaining its failure to produce certain payroll records and outlining the burden involved in complying with the court's order. In due course, Synergystex renewed its earlier motion for summary judgment, and DHT also moved for summary judgment, on the issue of whether the '493 patent is invalid because, allegedly, DHT fraudulently claimed small entity status and paid the small entity issue fee.

In an August 7, 1996 opinion, the district court addressed both the order to show cause and the summary judgment motions relating to the question of the small entity issue fee. *See* *DH Tech.* , 937 F. Supp. at 903-04, 40 USPQ2d at 1755-56. The court first addressed the order to show cause, issued to DHT based on its failure to comply with discovery:

> After reviewing the voluminous briefing on the Order to Show Cause, it appears that compliance with the Order compelling production was substantially more difficult than anticipated by the Court. The Court is convinced that DHT expended great effort to comply with the Order and did produce all documents that it was able to locate after a reasonable search. The Court hereby discharges the Order to Show Cause.
>
> The Order to Show Cause and the briefing in response to it, however, would not have been necessary if DHT had explained, at the time it produced the documents in April, why several months of the most important payroll records were missing. DHT shall pay Synergystex the attorneys' fees and costs Synergystex expended in briefing the Order to Show Cause, as a sanction for failure to fully comply with the Order compelling production, pursuant to Rule 37(b)(2) of the Federal Rules of Civil Procedure.

Id. at 904, 40 USPQ2d at 1756-57.

Next, the court denied DHT's motion for summary judgment on the small entity issue fee question and granted "summary judgment for Synergystex without reaching the inequitable conduct issue because, even if DHT's payment of an improper small entity issue fee was an error in good faith, it is now too late to correct the error." *Id.* at 903, 40 USPQ2d at 1755. The court concluded that " [t]he undisputed facts demonstrate that DHT could not properly claim small entity status when it paid the issue fee for the '493 patent." *Id.* at 905, 40 USPQ2d at 1757. In that regard, the court noted that declarations from accountants for both parties showed that DHT had over 500 employees in 1991, making it ineligible for small entity status. *See* *id.* at 905-06, 40 USPQ2d at 1757-58. Accordingly, the court determined that the '493 patent lapsed on January 21, 1992, pursuant to 35 U.S.C. Section 151 (the statutory

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provision that addresses abandonment of applications and lapse of patents for failure to pay the issue fee), because DHT had paid the small entity issue fee, which was half of the standard issue fee actually due. *See id.* at 907, 40 USPQ2d at 1759. Noting that DHT's improper payment of the small entity issue fee had not been corrected, the court examined whether correction was still possible. *See id.* The court concluded that correction was not possible under 35 U.S.C. Section 151, and 37 C.F.R. Section 1.317(b) (the regulation governing acceptance of late payment of the issue fee in cases where the patent has lapsed due to unavoidable delay in paying the issue fee), because DHT's payment of the incorrect issue fee was not "unavoidable." *See id.* at 907-08, 40 USPQ2d at 1759-60.

The district court then considered whether 37 C.F.R. Section 1.317 limited the time for correction of the erroneous payment of the small entity issue fee or whether 37 C.F.R. Section 1.28(c) (permitting correction of the erroneous, but good-faith, claim of small entity status and payment of small entity fees at any time) was the sole regulation governing correction. *See id.* at 907-10, 40 USPQ2d at 1759-61. The court noted that " [i]f Section 1.317 applies to the facts before us, then the Court must grant summary judgment for Synergystex, without any need for a showing of intent to defraud." *Id.* at 908, 40 USPQ2d at 1759. The court determined that if 37 C.F.R. Section 1.317 applied, DHT had to correct the error by January 21, 1993, a date long past. *See id.*, 40 USPQ2d at 1760. The district court concluded:

> Given that the PTO has expressly stated that it views an improper claim of small entity status to be a serious matter, the Court finds it implausible that the PTO intended that unintentional errors in claiming small entity status could be corrected up until the day the patent term
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>
> expires, while unintentional delays in payment of an increase in the issue fee could only be corrected within a year and three months of receiving notice of the increase. The Court, thus, finds that Section 1.28(c) must be read in conjunction with the deadlines set forth in Section 1.317 for correcting the payment of an insufficient issue fee. Pursuant to Section 1.317(c), a good-faith error in claiming small entity status, and in paying a small entity issue fee, must be corrected no later than one year and three months after the date of the notice of allowance, or within three months of the PTO's denial of a timely petition to accept late payment due to unavoidable delay.

Id. at 909, 40 USPQ2d at 1761. The district court concluded that the '493 patent lapsed on January 21, 1992, that the lapse could not be corrected after January 21, 1993 (one year and three months after the October 18, 1991 notice of allowance), and that "the '493 patent was essentially stillborn." *Id.* at 910, 40 USPQ2d at 1761. The district court denied DHT's motion for reconsideration or to amend the judgment. *See DH Tech., Inc. v. Synergystex Int'l, Inc.*, No. C-92-3307 WHO (Nov. 15, 1996), *vacated and amended by*, No. C-92-3307 WHO (N.D. Cal. Jan. 17, 1997).

IV.

Meanwhile, on August 2, 1996, while the case was pending before the district court, DHT filed a "Notification of Error in Payment of Issue Fee as a Small Entity" with the PTO. In so doing, DHT withdrew its small entity status and stated that small entity status "may have been claimed erroneously when the issue fee was paid on January 10, 1992." DHT resubmitted this filing on August 9, 1996, via facsimile, at the request of the PTO's Office of Petitions. On appeal, DHT claims to have had no

knowledge of the district court's August 7 ruling at the time it filed these submissions. The PTO accepted the payment of the fee deficiency on November 8, 1996, citing 37 C.F.R. Section 1.28(c). After learning of the district court's August 7 decision, however, the PTO vacated its ruling and held further action in abeyance pending further court action. 3

V.

In a March 28, 1997 opinion, the district court denied Synergystex's motion, made pursuant to 35 U.S.C. Section 285, for attorney's fees. *See* *DH Tech.* , No. C-92-3307 WHO, slip op. at 1 (May 28, 1997). The district court stated that it had not ruled in its earlier opinions "on the issues of intent to defraud, bad faith, or inequitable conduct" and that Synergystex had not made a clear and convincing showing to justify an award of fees. *Id.* at 3. In a September 26, 1997 opinion, the district court awarded Synergystex attorney's fees and costs incurred in briefing the order to show cause and statutory costs as a prevailing party. *See* *DH Tech., Inc. v. Synergystex Int'l, Inc.* , No. C-92-3307 WHO (N.D. Cal. Sept. 26, 1997).

As noted, both parties appeal various aspects of the district court's decisions. We have jurisdiction pursuant to 28 U.S.C. Section 1295 (a)(1).

DISCUSSION

I.

Summary judgment is proper in a case where there is no genuine issue as to any material fact and the moving party is entitled to judgment as a matter of law. *See* Fed. R. Civ. P. 56(c). We review the district court's grant of summary judgment *de novo* . *See* *Aktiebolag v. E.J. Co.* , 121 F.3d 669, 672, 43 USPQ2d 1620, 1622 (Fed. Cir. 1997) (citing *Conroy v. Reebok Int'l, Ltd.* , 14 F.3d 1570, 1575, 29 USPQ2d 1373, 1377 (Fed. Cir. 1994)); *Cole v. Kimberly-Clark Corp.* , 102 F.3d 524, 528, 41 USPQ2d 1001, 1004 (Fed. Cir. 1996).

II.

The statutory system of patent fees allows a qualifying small business concern, independent inventor, or nonprofit organization to pay half of the standard issue fee. *See* 35 U.S.C. Section 41(a)(2), (h)(1) (1994). A party qualifying for the reduced fees is referred to

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as a "small entity." *See* 37 C.F.R. Section 1.9(f) (1997). The regulations define a small business concern "as one whose number of employees, including those of its affiliates, does not exceed 500 persons." 37 C.F.R. Section 1.9(d) (1997); *see* *Manual of Patent Examining Procedure* Section 509.02 (6th ed. 1997) (" *MPEP* ") (detailing the criteria necessary to establish small entity status). "The number of employees of a business concern is determined by averaging the number of persons of the concern and its affiliates employed on a full-time, part-time, or temporary basis during each of the pay periods for the preceding completed twelve (12) calendar months." *MPEP* Section 509.02.

An applicant establishes small entity status by filing a verified statement, averring "that the concern qualifies as a small business concern," with the PTO. 37 C.F.R. Section 1.27(c) (1997); *see* 37 C.F.R.

Section 1.27(a) (1997); *MPEP* Section 509.03. It is undisputed that DHT claimed small entity status and paid the small entity issue fee, despite, at the relevant time, exceeding the maximum number of employees permitted to qualify as a small business concern. *See DH Tech.*, 937 F. Supp. at 905-06, 40 USPQ2d 1757 (explaining that DHT had an average of over 500 employees in 1991, the year prior to payment of the issue fee).

Given DHT's error, we must address which statutory and regulatory provisions govern the correction of the erroneous payment of the small entity issue fee, a question of first impression. Statutory interpretation is a question of law, which we review *de novo*. *See In re Portola Packaging, Inc.*, 110 F.3d 786, 788, 42 USPQ2d 1295, 1297 (Fed. Cir. 1997); *Merck & Co., Inc. v. Kessler*, 80 F.3d 1543, 1549, 38 USPQ2d 1347, 1351 (Fed. Cir. 1996). On appeal, DHT argues that correction of the erroneous payment of the small entity issue fee is governed exclusively by 37 C.F.R. Section 1.28(c) and that 35 U.S.C. Section 151 and 37 C.F.R. Section 1.317 are inapplicable to the facts of this case. For its part, Synergystex contends that the district court properly determined that the '493 patent lapsed under 35 U.S.C. Section 151 for failure to pay the standard issue fee. Synergystex argues that the time for correcting an underpayment of the issue fee is governed exclusively by 37 C.F.R. Section 1.317(c) and that because DHT failed to correct the underpayment within the permitted time, it cannot now correct the error. Synergystex asserts that 37 C.F.R. Section 1.28(c) does not increase the time for correction specified in 37 C.F.R. Section 1.317(c).

The district court concluded that the '493 patent had lapsed pursuant to 35 U.S.C. Section 151. *See DH Tech.*, 937 F. Supp. at 907, 40 USPQ2d at 1759. Section 151 provides:

> If it appears that applicant is entitled to a patent under the law, a written notice of allowance of the application shall be given or mailed to the applicant. The notice shall specify a sum, constituting the issue fee or a portion thereof, which shall be paid within three months thereafter.
>
> Upon payment of this sum the patent shall issue, but if payment is not timely made, the application shall be regarded as abandoned.
>
> Any remaining balance of the issue fee shall be paid within three months from the sending of a notice thereof, and if not paid, the patent shall lapse at the termination of this three-month period. . . .
>
> If any payment required by this section is not timely made, but is submitted with the fee for delayed payment and the delay in payment is shown to have been unavoidable, it may be accepted by the Commissioner as though no abandonment or lapse ever occurred.

35 U.S.C. Section 151 (1994). The district court determined that although 37 C.F.R. Section 1.28(c) permits correction of the erroneous payment of the small entity issue fee at any time, *see DH Tech.*, 937 F. Supp. at 907-08, 40 USPQ2d at 1759, section 1.317 of 37 C.F.R. limits the time for correction to a year and three months after the date of the notice of allowance, *see DH Tech.*, 937 F. Supp. at 909, 40 USPQ2d at 1761. Section 1.28(c) of 37 C.F.R. provides:

> If status as a small entity is established in good faith, and fees as a small entity are paid in good faith, in any application or patent, and it is later discovered that such status as a small entity was established in error or that through error the Patent and Trademark Office was not notified of a change in status . . . the error will be excused (1) if any deficiency between the amount paid and the amount due is paid within three months after the date the error occurred or (2) if any deficiency between the amount paid and the amount due is paid more than three months after the date the error

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occurred and the payment is accompanied by a statement explaining how the error in good faith occurred and how and when the error was discovered. . . .

37 C.F.R. Section 1.28(c) (1997). 4 Section 1.317 of 37 C.F.R. provides:

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(a) If the issue fee paid is the amount specified in the Notice of Allowance, but a higher amount is required at the time the issue fee is paid, any remaining balance of the issue fee is to be paid within three months from the date of notice thereof and, if not paid, the patent will lapse at the termination of the three-month period.

(b) The Commissioner may accept the payment of the remaining balance of the issue fee later than three months after the mailing of the notice thereof as though no lapse had ever occurred if upon petition the delay in payment is shown to have been unavoidable. The petition to accept the delayed payment must be promptly filed after the applicant is notified of, or otherwise becomes aware of, the lapse. . . .

(c) The Commissioner may, upon petition, accept the payment of the remaining balance of the issue fee later than three months after the mailing of the notice thereof as though no lapse had ever occurred if the delay in payment was unintentional. The petition must be:

. . .

(4) Filed either:

(i) Within one year of the date on which the patent lapsed; or

(ii) Within three months of the date of the first decision on a petition under paragraph (b) of this section which was filed within one year of the date on which the patent lapsed.

37 C.F.R. Section 1.317 (1997). 5

We begin our analysis with 35 U.S.C. Section 151, the statutory provision governing payment of the issue fee. Pursuant to 35 U.S.C. Section 151, Para. 2, failure to pay the issue fee specified in the notice of allowance within three months of the mailing of that notice results in abandonment of the application. DHT paid the issue fee specified in the notice of allowance, albeit reduced on the basis of its claimed small entity status. *See* *DH Tech.* , 937 F. Supp. at 903-04, 40 USPQ2d at 1756. Therefore, the application was not abandoned pursuant to 35 U.S.C. Section 151, Para. 2.

The statute further provides that any balance of the issue fee due shall be paid within three months of "the sending of a notice thereof" or the patent shall lapse. 35 U.S.C. Section 151, Para. 3 (1994). This provision reflects a prior scheme under which the issue fee was collected in two installments, a base fee payable before the patent issued and a balance of the issue fee due payable within three months of the issue date. *See* *Ex parte Crissy, Spano, and Wolff* , 201 USPQ 689, 692 (Patent and Trademark Office Bd. of Appeals 1976); *In re Turner* , 3 USPQ2d 1214, 1217, 1221 (U.S. Dept. of Commerce Office of Admin. Law Judge 1985, 1986) (detailing the lapse of a patent because the balance of issue fee due was not timely paid). The two-installment scheme allowed for an exact calculation of the issue fee, which at that time depended on the number of pages printed and the number of drawing sheets. *See*

Ex parte Crissy , 201 USPQ at 692. The lapse provision of 35 U.S.C. Section 151, Para. 3 is no longer relevant to the two-installment issue fee payment scheme, which was eliminated on October 1, 1982. *See* *Changes In Procedures for Revival of Patent Applications and Reinstatement of Patents* , 58 Fed. Reg. 44277, 44278 (Aug. 20, 1993) (hereinafter " *Changes In Procedures* ") (explaining that subsequent to October 1, 1982 all applicants were required to pay the same issue fee regardless of the size of the specification and drawings, thereby replacing the two-installment issue fee scheme).

The statutory lapse provision of 35 U.S.C. Section 151, Para. 3 also applies when a fee increase takes effect after the mailing of the notice of allowance but prior to payment of the issue fee. *See* *In re Mills* , 12 USPQ2d 1847, 1848 (U.S. Patent and Trademark Office Comm'r of Patents and Trademarks 1989). The PTO adopted a policy to address this situation under 35 U.S.C. Section 151, Para. 3:

> The policy of the [PTO] will be that if the fee specified on the Notice of Allowance and Issue Fee Due is paid by the due date the application will not be regarded as abandoned. Applicant will be sent a notice of balance of issue fee due and given three months to pay the remainder of the issue fee. The patent will lapse if the balance of the issue fee is not paid within the allotted three months.

In re Mills , 12 USPQ2d at 1848. Section 151, Para. 3 of Title 35 thus remains relevant to the situation in which a fee increase takes

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effect after the mailing of the notice of allowance but prior to payment of the issue fee. *See* *Changes In Procedures* , 58 Fed. Reg. 44278.

The Commissioner may accept late payment of the remaining balance of the issue fee due when the delay in payment was unavoidable. *See* 35 U.S.C. Section 151, Para. 4 (1994); 37 C.F.R. Section 1.317(b) (1997). 6 DHT does not challenge the district court's holding that its delay in correcting the underpayment of the issue fee was not unavoidable. *See* *DH Tech.* , 937 F. Supp. at 907, 40 USPQ2d at 1759. Therefore, 35 U.S.C. Section 151, Para. 4 and 37 C.F.R. Section 1.317(b) do not apply to the facts of this case. The regulations further allow the Commissioner to accept the remaining balance of the issue fee due if the delay in payment was unintentional and a petition to allow late payment is filed within one year of the date on which the patent lapsed, i.e., within a year and three months of the notice of balance of issue fee due. *See* 37 C.F.R. Section 1.317(c) (1997). 7 The PTO has interpreted this regulation, and the lapse provision of 35 U.S.C. Section 151, Para. 3, as applying in the situation where a fee increase occurs after the mailing of the notice of allowance. *See* *Changes In Procedures* , 58 Fed. Reg. at 44278; *Changes to Patent Practice and Procedures* , 62 Fed. Reg. 53132, 53157 (Oct. 10, 1997) (explaining how the new Section 1.137, which incorporates the substance of Section 1.317(c) (1997), applies to such a situation).

While we agree that 35 U.S.C. Section 151, Para. 3, and 37 C.F.R. Section 1.317(c) apply in a case where a fee increase occurs after the mailing of the notice of allowance but prior to payment of the issue fee, we find no support for applying these provisions to the erroneous payment of the small entity issue fee. In fact, neither provision mentions small entity status. Before a patent lapses, pursuant to 35 U.S.C. Section 151, Para. 3, for failure to pay the balance of issue fee due, the PTO mails a notice of balance of issue fee due to the patentee. *See* 35 U.S.C. Section 151, Para. 3; *In re Mills* , 12 USPQ2d at 1848; *Changes In Procedures* , 58 Fed. Reg. 44278; *Changes to Patent Practice and Procedures* ,

62 Fed. Reg. at 53157. Since the PTO does not police or verify entitlement to claim small entity status, *see* *MPEP* Section 509.03; U.S. Patent and Trademark Office, 1098 *Official Gazette* 502-03 (Jan. 3, 1989), the PTO would not be aware that an applicant, who had erroneously claimed small entity status and paid the small entity issue fee, had a balance of issue fee due. Therefore, the PTO would be unable to send the notice of balance of issue fee due pursuant to 35 U.S.C. Section 151, Para. 3. This supports the conclusion that 35 U.S.C. Section 151 and 37 C.F.R. Section 1.317 do not apply to the erroneous payment of the small entity issue fee.

[1] Unlike 35 U.S.C. Section 151 and 37 C.F.R. Section 1.317, section 1.28 of 37 C.F.R., entitled "Effect on fees of failure to establish status, or change status, as a small entity," specifically addresses the correction of an erroneous claim of small entity status and the erroneous payment of the small entity issue fee. Section 1.28(c)(2) of 37 C.F.R. permits a patentee to correct the erroneous payment of the small entity issue fee at any time, provided the "payment [of the amount owing] is accompanied by a statement explaining how the error in good faith occurred and how and when the error was discovered." 8 We hold that this regulation is the sole provision governing the time for correction of the erroneous payment of the issue fee as a small entity. *See* *Jewish Hosp. v. Idexx Lab.* , 951 F. Supp. 1, 2 (D. Me. 1996) (holding that 37 C.F.R. Section 1.28(c) governs correction of an erroneous claim of small entity status and the erroneous payment of the small entity issue fee). Our decision is consistent with current patent practice:

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37 CFR 1.28 also provides guidance as to the effect of improperly establishing status as small entity. . . .

When small entity status has been established in error and small entity fees have been paid in error, the matter is to be addressed under 37 CFR 1.28(c).

MPEP Section 509.03. Because we conclude that the timing of correction of the erroneous payment of the small entity issue fee is governed exclusively by 37 C.F.R. Section 1.28(c), the district court erred in its determination that the '493 patent had lapsed pursuant to 35 U.S.C. Section 151 and could not be revived because 37 C.F.R. Section 1.317 limited the time during which the error could be corrected.

While 37 C.F.R. Section 1.28(c) governs the correction of the erroneous payment of the small entity issue fee and does not limit the time during which such an error may be corrected, the regulation does provide meaningful limits on the circumstances in which correction is permissible. A patentee may correct the erroneous payment of the small entity issue fee " [i]f status as a small entity is established in good faith" and the small entity issue fee was "paid in good faith." 37 C.F.R. Section 1.28(c) (1997). The regulation additionally provides:

(d)(1) Any attempt to fraudulently (i) establish status as a small entity or (ii) pay fees as a small entity shall be considered as a fraud practiced or attempted on the Office.

(2) Improperly and with intent to deceive

(i) Establishing status as a small entity, or

(ii) Paying fees as a small entity shall be considered as a fraud practiced or attempted on the Office.

37 C.F.R. Section 1.28(d) (1997); *see* *MPEP* Section 509.03. These regulations permit correction of honest mistakes, but prevent attempts to fraudulently pay the small entity issue fee while maintaining an enforceable patent. As aptly stated by the district court:

> Presumably, a small company with fewer than 500 employees will not be overly burdened in calculating an exact count of its employees for the appropriate period before claiming small entity status. Where the cost exceeds the discount in the issue fee granted to small entities, the applicant is free to pay the full issue fee. *Indeed, where there is the slightest doubt about an applicant's entitlement to claim small entity status, the applicant would be foolish not to pay the full issue fee* .

DH Tech. , 937 F. Supp. at 909-10, 40 USPQ2d at 1761 (emphasis added); *see* *Changes to Patent Practice and Procedure* , 62 Fed. Reg. at 53135 ("Nevertheless, an applicant or patentee can avoid undesirable results by not claiming small entity status unless it is absolutely certain that the applicant or patentee is entitled to small entity status (*i.e.* , resolving any doubt, uncertainty, or lack of information in favor of payment of the full fee).").

The district court specifically noted that it was not addressing DHT's intent in reaching its decision. *See* *DH Tech.* , 937 F. Supp. at 903, 908, 910, 40 USPQ2d at 1755, 1759, 1761. On remand the district court should assess whether DHT acted in "good faith," i.e., whether DHT fraudulently established status as a small entity or fraudulently paid the small entity issue fee. *See* 37 C.F.R. Sections 1.28(c), (d) (1997). We express no opinion on this issue; rather we leave the issue to be addressed by the district court in the first instance.

III.

As noted above, the district court ordered DHT to pay Synergystex's attorney's fees and costs associated with the order to show cause as a sanction for failing to comply with the court's order compelling the production of documents related to DHT's entitlement to claim small entity status. *See* *DH Tech.* , 937 F. Supp. at 904, 40 USPQ2d at 1756-57. On appeal, DHT argues that it complied with the district court's discovery order and that the award of attorney's fees and costs was unjustified. Synergystex responds that the district court's order required actual delivery of the documents at issue and that DHT repeatedly failed to produce the documents. Synergystex also argues that, given DHT's repeated failure to comply with the district court's order, the court did not abuse its discretion in sanctioning DHT.

We review procedural matters not unique to patent law under the law of the regional circuit court where appeals from the district court would normally lie. *See* *Panduit Corp. v. All States Plastic Mfg. Co.* , 744 F.2d 1564, 1574-75, 223 USPQ 465, 472 (Fed. Cir. 1984). Therefore, we review Rule 37 sanctions under an abuse of discretion standard. *See* *Refac Int'l, Ltd. v. Hitachi, Ltd.* , 921 F.2d 1247, 1253-54, 16 USPQ2d 1347, 1352 (Fed. Cir. 1990) (citing *Halaco Eng'g Co. v. Costle* , 843 F.2d 376, 379 (9th Cir. 1988)); *Payne v. Exxon Corp.* , 121 F.3d 503, 507 (9th Cir. 1997). "The district court's discretion will not be disturbed unless we have a definite and firm conviction that the court committed a clear error of judgment in the conclusion it reached." *Payne* , 121 F.3d at 507.

[2] Rule 37(b)(2) permits the court to order a party to pay the reasonable expenses, including attorney's fees, caused by that party's failure to comply with the court's discovery order. *See* Fed. R. Civ. P. 37(b)(2). While acknowledging that DHT had expended "great effort" to comply with the court's discovery order relating to the production of documents showing the number of employees at DHT during the relevant periods, the district court noted that DHT had failed to explain at the time of production why several of the most important documents were missing. *See* *DH Tech.* , 937 F. Supp. at 905, 40 USPQ2d at 1756-57. The district court concluded that DHT had failed to fully comply with its discovery order and therefore sanctioned DHT pursuant to Rule 37(b)(2). *See* *id.* In view of DHT's failure to timely produce the documents at issue in response to various warnings by the court, and in view of DHT's failure to provide a reason or explanation for its lack of production, we cannot say that the district court abused its discretion in awarding attorney's fees and costs expended in briefing the order to show cause. *See* *Payne* , 121 F.3d at 507 ("A district court's finding that one of its orders was violated is entitled to considerable weight because a district judge is best equipped to assess the circumstances of the non-compliance." (internal quotations and citation omitted)); *United States v. Sumitomo Marine & Fire Ins. Co.* , 617 F.2d 1365, 1369 (9th Cir. 1980) (the sanction of awarding attorney's fees and costs is the least harsh of the sanctions available under Rule 37(b)(2)). DHT's belated compliance with the court's order does not negate the imposition of sanctions. *See* *Payne* , 121 F.3d at 508.

IV.

Finally, we turn to the two issues raised by Synergystex in its cross-appeal. First, Synergystex argues that the district court erred in granting summary judgment on its implied license defense. *See* *DH Tech.* , No. C-92-3307 WHO, slip op. at 17 (Nov. 28, 1995). DHT argues that the district court properly granted summary judgment on the undisputed facts. In its amended complaint, filed August 20, 1992, DHT included the following statement, "The activities of Synergystex have been without express or implied license by DH Technology." In answering this statement, Synergystex responded:

> Defendant admits that there is no express or implied license with respect to the '493 patent but denies that such a license is required under the '493 patent to enable defendant to lawfully make, use and sell its products.

While the district court addressed the merits of Synergystex's implied license defense, the court noted that "Synergystex did not plead this license defense in its answer, and failed to formally raise the defense until September 16, 1993, nearly two months after the close of discovery." *Id.* at 13. In any event, we have carefully considered the implied license issue. Having done so, we see no reason to disturb the district court's grant of summary judgment.

Synergystex also challenges the district court's decision that this was not an exceptional case under 35 U.S.C. Section 285. *See* *DH Tech.* , No. C-92-3307 WHO, slip op. at 1, 3 (May 28, 1997). Section 285 of title 35 provides, "The court in exceptional cases may award reasonable attorney fees to the prevailing party." *See* *Gentry Gallery, Inc. v. Berkline Corp.* , 134 F.3d 1473, 1480, 45 USPQ2d 1498, 1504 (Fed. Cir. 1998) (detailing the requirements for an award of attorney's fees under section 285). Because the case is not yet complete, any analysis of exceptional case status would be premature. We need not address Synergystex's claim given our reversal of the district court's decision on the correction of the erroneous payment of the small entity issue fee. Because the case has not yet been

resolved and the prevailing party has not yet been determined, we necessarily vacate the district court's decision regarding exceptional case status. Synergystex may renew its claim for attorney's fees under 35 U.S.C. Section 285 at the close of the proceedings, should it be the "prevailing party" as that term is used in the statute.

CONCLUSION

For the foregoing reasons, we vacate the district court's decision that the '493 patent lapsed because of the erroneous payment of the small entity issue fee and could not be revived because the time during which this error could be corrected had passed. We hold that the timing of correction of the erroneous payment of the small entity issue fee is governed solely by 37 C.F.R. Section 1.28(c), not 35 U.S.C. Section 151 and 37 C.F.R. Section 1.317. We remand for the district court to consider the arguments of the parties under the correct legal standard and to consider whether DHT met the other criteria, specified in 37 C.F.R. Sections 1.28(c), (d), for correcting the error. We also vacate the district court's decision on exceptional case status because the issue cannot be addressed until there is a prevailing party. Because the district court did not

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err in sanctioning DHT for its conduct during discovery and for failing to comply with the court's discovery orders, and because the court did not err in denying Synergystex's implied license defense on summary judgment, we affirm those rulings.

COSTS

Each party shall bear its own costs.

AFFIRMED-IN-PART, VACATED-IN- PART, AND REMANDED .

Footnotes

Footnote 1. During this appeal, DH Technology, Inc. merged with Axiohm S.A. to form Axiohm Transaction Solutions, Inc. Because all of the documentation presented to the United States Patent and Trademark Office and to the district court refers to DHT, we will, for consistency, refer to this party as DHT throughout this opinion.

Footnote 2. The '493 patent underwent reexamination, and the patentability of all claims was confirmed on November 21, 1995.

Footnote 3. While the district court in this case concluded that correction of the erroneous payment of the small entity issue fee must satisfy the requirements of 37 C.F.R. Section 1.317, *see DH Tech.* , 937 F. Supp. at 909, 40 USPQ2d at 1761, the court in *Jewish Hospital v. Idexx Laboratories* , 951 F.

Supp. 1, 2 [42 USPQ2d 1720] (D. Me. 1996), held that correction was governed solely by 37 C.F.R. Section 1.28(c). Given this conflict, the PTO is holding all issue fee correction submissions in abeyance pending resolution of this appeal. *See* U.S. Patent and Trademark Office, 1198 *Official Gazette* 27 (May 6, 1997). The PTO has not expressed its view on whether 37 C.F.R. Section 1.28(c), 37 C.F.R. Section 1.317, or both govern the timing of correction. *See* *Changes to Patent Practice and Procedures* , 62 Fed. Reg. 53132, 53135 (Oct. 10, 1997).

Footnote 4. The PTO amended the regulations, effective December 1, 1997. Section 1.28(c) of 37 C.F.R. remained substantively unchanged. Under the new regulation, a party need not submit a statement explaining how the error occurred and when the error was discovered. Submission of the fee deficiency will be treated as a representation that small entity status was established in good faith and small entity fees were paid in good faith. *See* *Changes to Patent Practice and Procedures* , 62 Fed. Reg. at 53135, 53184.

Footnote 5. In the revised regulations, the substance of subsections b and c of Section 1.317 have been incorporated into 37 C.F.R. Section 1.137. *See* *Changes to Patent Practice and Procedures* , 62 Fed. Reg. at 53157, 53171, 53194-95, 53198. The new section 1.137(a) addresses unavoidable delays, and section 1.137(b) addresses unintentional delays. *See* *id.* at 53194-95.

Footnote 6. The explanation accompanying the new regulations states that the new Section 1.137(a) governs the late payment of a balance of issue fee due, which can occur when a fee increase takes effect after the mailing of the notice of allowance but prior to payment by the applicant, when the delay in payment was unavoidable. *See* *Changes to Patent Practice and Procedure* , 62 Fed. Reg. at 53157. In the new regulations Section 1.137(a) replaces the former Section 1.317(b). *See* *id.* at 53157-58, 53194-95.

Footnote 7. In the new regulations, Section 1.137(b) governs acceptance of late payment where the delay was unintentional. *See* *Changes to Patent Practice and Procedures* , 62 Fed. Reg. at 53157-58, 53195. The requirement that a petition to accept late payment of the balance of issue fee due be filed within one year of the date on which the patent lapsed, contained in 37 C.F.R. Section 1.317 (c)(4) (1997), has been deleted in the new regulations. *See* *id.* at 53158. However, the applicant must show that the entire delay, from the time payment was due until the PTO grants a petition to accept late payment, was unintentional. *See* *id.* at 53195 (new Section 1.137(b)(3)).

Footnote 8. The amended version of Section 1.28(c) does not require such a statement. Instead, a fee deficiency statement submitted under this provision will be treated as a representation by the party that small entity status was established in good faith and small entity fees were paid in good faith. *See* *Changes to Patent Practice and Procedures* , 62 Fed. Reg. at 53135.

- End of Case -

151. At the receiver, the transmitted control signals are used to construct complete program information from the transmitted program materials. (RX 1542, col. 1, ll. 13-16).

152. [There is no finding 152]

153. The systems described in both Yanagimachi and Iijima process the signals based on control information contained in the actual transmission. (RX 213, col. 6, ll. 38-57; RX 1542, col. 1, ll. 10-16).

154. United States Patent No. 4,310,854 issued to [*148] Ralph Baer (the Baer patent) was presented to the patent examiner for consideration with the '277 patent. (CX 2 at 3; Davis Tr at 3245-46; RX 220).

155. The Baer patent is directed to a system for transmitting and displaying closed captioning. (Davis Tr at 3245-46; RX 220, col. 1, l. 46 through col. 2, l. 5).

156. In the system described in the Baer patent, the caption information is transmitted as digital data superimposed on the transmitted FM sound signal. (RX 220, col. 1, ll. 46-51).

157. In the system described in the Baer patent, at the receiving end, the data is extracted, stored, reformatted and used to drive a character generator. (RX 220, col. 1, ll. 63-68). The character generator recreates the video signals for the closed captions. (RX 220, col. 1, l. 66 through col. 2, l. 1). These video signals are applied to a crow bar modulator which overlays the alphanumeric characters on the pictorial presentation. (RX 220, col. 2, ll. 1-5; RX 220, col. 3, ll. 53-58).

158. The Baer patent discloses the transmission of closed captions as digital information contained in a television transmission. (RX 220, col. 1, ll. 46-51).

G. Domestic Industry

159. The business of PMC consists [*149] primarily of licensing its intellectual property and prosecution of patent applications. PMC also pursues joint venture partners to develop its patented inventions. (Metzger, Tr at 180-81, 205) .

160. As of June 11, 1997, with respect to any of PMC's current licensees, PMC does not design any tangible products for those licensees, nor does it work with manufacturers of those licensees' products in any way, nor does PMC monitor the quality of those licensees' products or services in any way, nor does PMC do any kind of safety checking on the products produced by those licensees, nor does PMC participate in any marketing efforts made on behalf of the products or services licensed under its patents. (Metzger, RX 128 at 469, 470).

161. When Metzger was asked whether PMC consults with any of its licensees on any kind of new product or service design, PMC's Metzger testified (RX 128 at 470-474):

A. Yes.

Q. Would you please describe those efforts?

A. I've had discussions with The Weather Channel and I'm continuing to have discussions with The Weather Channel as to products and services, interactive products and services that they may or may not introduce in the future that would [*150] use our patents.

Q. Does anyone at PMC consult with any other of its licensees regarding new products or services?

A. Not at this time.

Q. Would you please describe for me the nature of your consulting endeavors?
* * *

THE WITNESS: There are two forms. One is The Weather channel is interested in our view of companies that may infringe their exclusive license with us and they are also interested in our view of how their option agreement for additional license rights particularly in light of interactive Weather Channel services might be implemented and protected with our intellectual property.

BY MS. NELSON:

Q. What form does your participation in this consultation take?

A. Well, there have been meetings with their outside patent counsel and our outside patent counsel to discuss some of the technical patent issues. There's a planning session scheduled for next week in Atlanta with the business people that I'm participating in as part of their task force, their business task force and there have been telephone conversations between me and Weather Channel people.

Q. From PMC's point of view what is the optimum outcome of these negotiations?

* * *

THE [*151] WITNESS: We -- our goal is for our licensees to have -- it sounds so trite -- have meaningful licenses that are helpful to their business situation and we believe that Weather Channel is greatly advantaged by the intellectual property that they've purchased from us and that in a -- so if they have been benefited from the license and the money they've paid us that's good.

Also if we can design some products and services that they implement on an incremental basis it could potentially mean more income for us which is obviously good and as these interactive embodiments of the Harvey patents, of the PMC patents become implemented then other companies that are not weather related may well see the -- may be easier to show them the value of our patents and they will be more interested in taking licenses from us so we see them as kind of a lead licensee in this and we're -- hope they are greatly benefited from them.

BY MS. NELSON:

Q. Are new products and services actually being developed from an engineering point of view?

A. By The Weather Channel?

Q. By anyone.

A. I believe so.

Q. Do you participate in that development?

A. Our relationship with The Weather Channel [*152] is evolving and I think that will probably happen in the future.

Q. Is PMC involved at present in engineering any new products or services for The Weather Channel?

A. No.

* * *

Q. . . . Do the new products and services being engineered by The Weather Channel use the '277 patent?

A. I believe they will.

Q. What are your duties or responsibilities as part of the business task force of The Weather channel which will be meeting next week?

A. Phase one is to attend and contribute if appropriate.

Q. What is the purpose of the meeting?

A. Looking at the development of new products and services and also what other competitors of theirs are doing in the industry. I think I just answered that one.

Q. What do you mean by contribute if appropriate?

A. They've asked me for my ideas and thoughts and what -- from PMC's perspective what's -- contribute knowledge.

162. The business of PMC today is (1) the prosecution of patents which John Harvey does and Ms. Metzger is not involved in at all, (2) licensing and (3) to a small extent, it's looking for joint venture partners and the development of business. (Metzger Tr at 180).

163. McCandless is PMC's financial and [*153] administrative officer of the company and he supports the licensing efforts and the prosecution of the patent efforts. Caird worked with Metzger on licensing. PMC has an administrative assistant or secretary who's full time and primarily supports Metzger and Caird in the licensing efforts PMC also has a part-time general counsel. (Metzger Tr at 181).

164. Since the first half of 1994, inventor Harvey has focused his time heavily on the prosecution of patent applications and some time in the first half of 1994, Harvey drastically reduced his involvement in licensing for PMMC or PMC. Prior to some time in the first half of 1994, Harvey was involved in licensing for PMMC and one license that he handled was the negotiation of the license between StarSight and PMMC. (Harvey Tr at 1054, 1055).

165. [* * *]

166. PMC licensees want to be sure that there are no additional claims in any future patent or any other patent that could be at issue against them and its PMC's business accommodation to include all of the patents in a particular field of use in a license. (Metzger Tr at 243).

167. There are no PMC licenses that exist solely with respect to the '277 patent. (Metzger Tr at 243). [*154]

168. In PMC's efforts to license PMC patents, Caird is not aware of any attempt by PMC to license a single patent as opposed to a portfolio of patents. (RX 125 at 190).

169. [* * *]

170. As a part of its licensing efforts, PMC has sent a brochure entitled "Direct Broadcast Satellite Patent Coverage" to many different companies. That brochure focuses on PMC patented technologies that relate to Direct Broadcast Satellite systems. It reads in part:

PMC's technologies are divided into two principal areas, Infrastructure Technologies and the PMC System.

PMC's Infrastructure Technologies define the infrastructure of today's so-called convergence of communications and computing in a networked environment. The PMC System is an integrated system of communication that enables content providers to create, simultaneously for all members of an audience of any size, "personalized media" -- video, audio and/or electronic print content which have relevance to audience members on an individual-by-individual basis.

The Companies technologies are covered by six issued U.S. patents... [U.S. Patent Nos. 4,694,490, 4,704,725, 4,965,825, 5,109,414, 5,233,654 and 5,335,277], and over three hundred [*155] pending patents. All six patents are based on disclosure in the Company's first U.S. patent filing in 1981 [Serial No. 317,510 filed 11/3/81]. This early disclosure and end-to-end focus has resulted in a broad portfolio of intellectual property that PMC believes to be seminal -- comparable to market defining companies such as Polaroid and Xerox.

PMC is also aggressively prosecuting extensive coverage internationally based on it's 1987 U.S. application [Serial No. 96,096 filed 9/11/87]. Filings have been made in Japan, Australia and the European Patent Office which covers Austria, Belgium, France, Germany, Italy, Luxembourg, the Netherlands, Sweden, Switzerland and the United Kingdom.

(CX 18 "Direct Broadcast Satellite Patent Coverage" at 3, P 4 (PMC 301330); Metzger, RX 128 at 418-419).

171. PMC in sending out a draft contract to potential licensees based on a working document from PMC's Sony experience. Metzger estimated that PMC has approved some 40, 50 companies, not 2000 and not 3. (Metzger Tr at 194).

172. [* * *]

173. [* * *]

174. [* * *]

175. PMC drafted a document entitled "Proposal to Formalize a Business Relationship Between Viacom International and Personalized [*156] Media Communications" dated March 10, 1995. (RX 14; Cairn, RX 125 158-159).

176. [* * *]

177. [* * *]

178. [* * *]

179. [* * *]

180. In licensing discussions with Hewlett-Packard, PMC gave Hewlett-Packard an overview of both PMMC's issued and pending patents. (CX 19).

181. [* * *]

182. [* * *]

183. [* * *]

184. [* * *]

185. [* * *]

186. Metzger gave Caird a copy of the April 26, 1993 draft letter to ARC to keep Cairn informed of her activities. (Caird, RX 125 at 149-150; RX 12).

187. On January 13, 1995, Caird of PMC sent a letter to Ann Kirschner of the National Football League (NFL) in order to explore the possibility of licensing the NFL to the PMC patents. (RX 13; Metzger Tr 246-247; Caird, RX 125 152-153).

188. In his letter dated January 13, 1995 to Ann Kirschner of the NFL, Caird described some reasons why the NFL might want to license the PMC patents. (RX 13; Caird, RX 125 153).

189. [* * *]

190. [* * *]

191. At the time Caird wrote the January 13, 1995 letter to Kirschner, Cairn

was Senior Vice President of PMC. (M. Metzger Tr 250).

192. Metzger was aware that Caird had written the January 13, 1995 letter to Kirschner. (Metzger Tr 247).

193. [* * *]

194. [*157] [* * *]

195. PMC engaged in litigation with The Weather Channel in the U.S. district court for the eastern district of Virginia in which litigation PMC alleged infringement of the '277 patent, the '825 patent and the '414 patent. The complaint was dated March 9, 1995. (CX 13).

196. The Weather Channel litigation resulted in a "Settlement Agreement And Mutual General Release" as well as a "Patent License Agreement For Landmark Communications, Inc. And The Weather Channel, Inc." (CX 14, CX 15).

197. [* * *]

198. An Agreement to Enter License Agreement and Licensable Product Option Agreement by and between PMMC, Starsight and Sony, was entered into as of October 31, 1995 and is currently in effect. (Metzger, Tr at 188; CX 12).

199. [* * *]

200. [* * *]

201. [* * *]

202. [* * *]

203. [* * *]

204. [* * *]

205. The Weather Channel license was entered into on January 31, 1996 and is currently in effect. (Metzger, Tr at 192; CX 15).

206. As part of resolving the federal court litigation, the Weather Channel was desirous of obtaining certain licenses in and options to license the subject patents, as that term is defined in the license agreement. (CX 15 at 2).

207. [* * *]

208. [*158] [* * *]

209. PMMC sought the advice of experienced patent professionals about how best to commercialize its patents. (RX 8 at 1)(BFF 119)

210. The advice which PMMC received from experienced patent professionals about commercializing its patents made sense to PMMC as reflecting a realistic view of exploiting patents. (RX 8 at 1) (BFF 120).

211. [* * *]

212. CX 101 is a Summary Chart showing three categories of expenditures related to PMC's business "Litigation," "Professional and Consulting Fees" and "Operating Expenses." (McCandless, CX7, at 3, Q10).

213. The time period covered by CX 101 (July 1, 1993 to March 31, 1997), was selected because it begins the calendar quarter following the filing of the application that resulted in the issuance of the '277 Patent in August, 1994 and ends with the most recent calendar quarter. (McCandless, CX 7, at 3, Q11).

214. Because the sale of assets of PMMC to PMC in December 1995 transferred the patent portfolio and the responsibilities of licensing the patent portfolio, seeking further patent rights and enforcing patent rights from PMMC to PMC, CX 101 generally reflects expenditures made by PMMC from July 1, 1993 to the end of 1995, and [*159] expenditures made by PMC since that date. (McCandless, CX7, at 2-3, Q6, Q11).

215. CX 101 reflects limited expenditures made by PMC in late 1995 and certain expenditures made by PMMC during 1996 and the first quarter of 1997 because there were expenditures incurred by those companies during that overlap period. (McCandless, CX 7 at 3, Q11).

216. [* * *]

217. [* * *]

218. "Litigation" expenditures shown in CX 101 reflect expenditures made in connection with the Weather Channel litigation only, because that is the only prior litigation in which the company has sought to enforce its patents. (McCandless, CX 7, at 3, Q11).

219. [* * *]

220. PMC's licensing efforts are directed at its entire patent portfolio which includes all six of the issued U.S. patents in said portfolio. (McCandless, CX7 at 40, Q11; Metzger, Tr at 182).

221. [* * *]

222. CX 102 is a chart entitled "PMC LICENSING EXPENDITURES -- LITIGATION, July 1993-March 1997." (CX 102).

223. CX 102 provides the details of the line designated "Litigation" in CX 101. The litigation expenditures reflected in CX 102 relate to the Weather Channel litigation in which three patents (the '825, '414, and '277 Patents) were asserted [*160] by PMMC. (CX 102; McCandless, CX 7, at 5, Q15).

224. CX 102 divides the expenses relating to the Weather Channel litigation in two categories: (1) "Legal Fees and Disbursements" which were paid to law firms and (2) "Professional Fees" which were paid to nine expert witnesses or consultants and to one law firm. (CX 102; McCandless, CX 7, at 5, Q15).

225. McCandless was the person responsible for paying all of the expenses reflected in CX 102. CX 102 does not include any expenses incurred by PMC in

connection with the instant investigation. (McCandless, CX 7, at 5, Q15).

226. The law firms of Howrey & Simon and Dorsey & Whitney represented PMMC, and later PMC, in the Weather Channel litigation in the Eastern District of Virginia. (McCandless, CX 7, at 5, Q16).

227. The law firms of Butler, Macon, Williams, Pantele and Lowndes, P.C., based in Richmond, Virginia, served as local counsel in that litigation. (McCandless, CX 7, at 5, Q16).

228. The law firms of Holtzman, Urquhart & Moore provided consulting advice and assisted in the settlement of the litigation. (McCandless, CX 7, at 5, Q16).

229. The law firms of Fried, Frank, Harris, Schriver & Jacobson represented H. Donald Wilson, [*161] a past consultant to PMMC, to prepare him for a possible deposition. (McCandless, CX 7, at 5, Q16).

230. [* * *]

231. [* * *]

232. [* * *]

233. [* * *]

234. [* * *]

235. [* * *]

236. CX 102 reflects payment by PMMC of professional fees in connection with the Weather Channel litigation to Bernard Lechner; Ellen Ryberg & Associates; Fried, Frank; Gideon Frieder; Jeffrey Krauss; Ronald Williams; Rubin, Bednarek & Associates; Stern Telecommunications Corporation; TeleResources and Tunno & Associates. (McCandless, CX 7, at 6, Q19).

237. Each person or entity listed in the previous finding of fact served as potential testifying witness or consulting expert with respect to the Weather Channel litigation. (McCandless, CX 7, at 6, Q19).

238. CX 102 also reflects payment by PMMC of travel and lodging expenses incurred by PMMC officers and Cuddihy to attend depositions or other activities related to the Weather Channel litigation. (McCandless, CX 7, at 7, Q22).

239. Out-of-pocket travel and lodging expenses reflected in CX 102 were reimbursed by PMMC upon the submission of expense reports substantiating such expenses, which records the company retains. (McCandless, CX 7, at 7, Q22). [*162]

240. [* * *]

241. McCandless did not attempt to allocate PMC's Weather Channel litigation expenses based upon efforts that were specifically directed toward the '277 patent. (McCandless, Tr at 928).

242. McCandless is not personally familiar with the legal documents that were

produced by the PMC's attorneys in the course of The Weather Channel litigation or with the legal arguments that were made during that litigation. (McCandless, Tr 929).

243. CX 104 is a chart entitled "PMC Licensing Expenditures -- Professional & Consulting Fees, July 1993-March 1997." (CX 104).

244. CX 104 provides the detail of expenditures shown in the line "Professional & Consulting Fees" in CX 101. (CX 101; CX 104; McCandless, CX 7, at 8, Q26).

245. Bruce Bassett is a consultant listed on CX 104 who was engaged to produce an advanced demonstration videotape for use in licensing activities. (CX 104; McCandless, CX 7, at 8, Q27).

246. Dennis Elliott is a consultant who was engaged to obtain market information and to identify potential licensees. (CX 104; McCandless, CX 7, at 8, Q27).

247. George Harvey is a consultant who was engaged to help the company with computer-related services supporting the [*163] licensing business. (CX 104; McCandless, CX 7, at 8, Q27).

248. Gerald Holtzman was engaged to assist the company in licensing its patents and identifying potential licensees. (CX 104; McCandless, CX 7, at 8, Q27).

249. H. Taylor Howard was engaged to identify and assist in discussions with potential licensees. (CX 104; McCandless, CX 7, at 8, Q27).

250. Leslie Sufrin & Co. is the companies' tax accountant who prepares tax returns and gives tax and accounting advice. (CX 104; McCandless, CX 7, at 8, Q27).

251. MWW Strategic Communications is a public relations firm engaged to provide market information and public relations advice and assistance in support of the licensing business. (CX 104; McCandless, CX 7, at 8, Q27).

252. One Trillion One is a company engaged to assist in developing PMC's web site. (CX 104; McCandless, CX 7, at 8, Q27).

253. Stern Telecommunications Corporation is a consulting firm which provides technical advice about the technology of potential licensees and assists in preparing claim charts. (CX 104; McCandless, CX 7, at 8, Q27).

254. VeriQuest Companies is an organization which supplied a consultant, Jerry Allgood, to identify and contact potential [*164] licensees. (CX 104; McCandless, CX 7, at 8, Q27).

255. Video Technologies International is a consulting company which supplied a consultant, Ms. Metzger, to obtain market information about potential licensees and to attend trade shows. (CX 104; McCandless, CX 7, at 8, Q27).

256. Prentice Hall is a company which serves as Delaware agent for PMMC and

PMC. (CX 104; McCandless, CX 7, at 8, Q27).

257. Professional fees were generally paid based on invoices submitted for services and reimbursement of out-of-pocket expenses. (CX 104; McCandless, CX 7, at 9, Q28).

258. [* * *]

259. [* * *]

260. [* * *]

261. [* * *]

262. There is no duplication of expenses between CX 102 and CX 104. (CX 102; CX 104; McCandless, CX 7, at 10, Q32).

263. CX 106 is entitled "PMC LICENSING EXPENDITURES -- OPERATING EXPENSES, July 1993-March 1997." (CX 106).

264. The expenses reflected in CX 106 are the normal expenses required to operate the company and do not duplicate any of the expenses reflected in CX 102 or CX 104. (CX 106; McCandless, CX 7, at 10, Q34).

265. McCandless testified that although he deducted certain items of overhead and variable expenses which were directly attributable to patent [*165] prosecution from the operating expenses shown in CX 106, he attributed most of PMMC and PMC overhead and variable costs to licensing activities because PMMC and PMC's primary business is licensing and exploiting its patent portfolio. (McCandless, CX 7, at 10, Q34). However, PMC's business is actually threefold. (Metzger, Tr 180:21 - 181:2).

266. McCandless testified that, other than its efforts to license its patents portfolio, PMMC and PMC pursued no other products, services or inventions in the marketplace during the period July, 1993 through March, 1997. (McCandless, CX 7, at 10, Q34). However, PMC does actively prosecute its numerous U.S. and foreign patent applications, and also pursues joint venture partners to develop its patents. (Metzger, Tr 180-181, 173-174).

267. CX 106 reflects the attribution of most of PMMC's and PMC's ordinary business expenses to licensing activities. (CX 106; McCandless, CX 7, at 10, Q34).

268. The "Office supplies" reflected in CX 106 include supplies, postage, computer software and similar expenses. (CX 106; McCandless, CX 7, at 11, Q35).

269. The "Repairs and Maintenance" expenses reflected in CX 106 are related to office equipment and PMC's [*166] telephone system. (CX 106; McCandless, CX 7, at 11, Q35).

270. The "Payroll Expense" reflected in CX 106 is salary and bonuses paid by PMMC to Caird in 1993-95 and salary and bonus paid by PMC to Christine Balconis (Administrative Assistant) in 1996-7. (CX 106; McCandless, CX 7, at 11, Q35).

271. [* * *]

272. "Officer Compensation" reflected in CX 106 represents PMMC's expenses in 1994-5 for medical plan coverage [* * *] and long term disability insurance coverage [* * *] (CX 106; McCandless, CX 7, at 11, Q35).

273. [* * *] (McCandless, CX 7, at 11, Q35).

274. The "Deferred Compensation Expense" reflected in CX 106 is the total of payments made in March, 1996 by PMMC to thirteen consultants to or officers of PMMC out of a portion of the proceeds received from settlement of the Weather Channel litigation. (CX 106; McCandless, CX 7, at 11, Q35).

275. McCandless testified that the "Benefit Plans" expenses reflected in CX 106 are expenses by PMMC in 1994-95 for a medical plan and long term disability insurance covering [* * *] The "Benefit Plans" expenses reflected in CX 106 also relate to PMC's expenses in 1996 for medical plan premiums and long-term disability insurance. (CX [*167] 106; McCandless, CX 7, at 11, Q35).

276. "Meals, Entertainment," "Travel - Other" (meaning not attributable to litigation), "Cabs and Fares" and "Meetings, Conferences" represents those types of costs incurred by PMC personnel in the ordinary course of the company's licensing activities. (CX 106; McCandless, CX 7, at 11, Q35).

277. "Legal Fees: Corporate" reflected in CX 106 are expenses paid to law firms for general corporate matters including securities and out-of-pocket expenses. McCandless testified that such legal fees do not include litigation, patent licensing, patent prosecution, nor the legal fees incurred in connection with the sale of assets from PMMC to PMC. (CX 106; McCandless, CX 7, at 11, Q35).

278. "Secretarial" and "Labor, Services" are payments to temporary workers who are not employees of the companies for general secretarial and clerical work. (CX 106; McCandless, CX 7, at 11, Q35).

279. "Computing Costs" reflected in CX 106 are fees to ADP for payroll processing and consulting services related to new computers which are not included on other exhibits. (CX 106; McCandless, CX 7, at 11, Q35).

280. "Advertising and Promotion" expenses reflected in CX 106 represent [*168] payments made to consultants for assistance in issuing press releases and general promotion and marketing advice. (CX 106; McCandless, CX 7, at 11, Q35).

281. The "Other Expenses" reflected in CX 106 were payments related to PMMC's move to a new office in September, 1994. (CX 106; McCandless, CX 7, at 11, Q35).

282. The "Depreciation" expense reflected in CX 106 relates to office equipment, the prototype and PMMC's legal fees associated with negotiating office leases. (CX 106; McCandless, CX 7, at 11, Q35).

283. The "Amortization" expense reflected in CX 106 relates to organizational expenses and PMC's legal fees associated with negotiating office leases. (CX 106; McCandless, CX 7, at 11, Q35).

284. "Interest Expense - Other" reflected in CX 106 is the current expense for the relevant period on a loan to PMMC which was repaid in March, 1994, advances made to the companies for working capital by officers, for delayed reimbursement of out-of-pocket expenses to officers and on the deferred payment of consulting fees to VeriQuest Companies. (CX 106; McCandless, CX 7, at 11, Q35).

285. McCandless testified that CX 106 excludes most of PMMC's and PMC's legal fees. (McCandless, CX 7, [*169] at 13, Q36).

286. CX 106 does not include legal fees incurred for licensing activities. (CX 106; McCandless, CX 7, at 13, Q36).

287. CX 106 does not include legal fees incurred in patent prosecution or any out-of-pocket expenses, fees to the patent office or travel expenses of Harvey related to the prosecution of PMC's patent portfolio. (CX 106; McCandless, CX 7, at 13, Q36).

288. CX 106 does not include interest expense paid on the note PMC issued to PMMC for the purchase of the patent portfolio, PMC's amortization expense on the patent portfolio purchased from PMMC, nor legal fees associated with the sale of assets transaction because such transaction was not necessary to continue the licensing business. (CX 106; McCandless, CX 7, at 13, Q36).

289. CX 106 does not include gifts and contributions. (CX 106; McCandless, CX 7, at 13, Q36).

290. McCandless testified that CX 106 does not reflect payment of taxes because most of those expenditures are based on the company's income. (CX 106; McCandless, CX 7, at 13, Q36).

291. [* * *]

292. [* * *]

293. [* * *]

294. During a portion of the period reflected in CX 106 (from July, 1993 until August, 1994) the '277 Patent was pending [*170] before the U.S. Patent and Trademark Office but had not yet issued. (CX 106; CX 3).

295. All of PMC's existing and proposed license agreements make specific reference to all of PMC's pending applications. (See CX 12, Appendix B; CX 15, Schedule A; CX 21, Schedule A; CX 22, at PMC 301418-425; CX 24, at PMC 301478-485; CX 25 at PMC 272717-724).

296. McCandless is aware that PMC's license agreements all specifically reference PMC's pending applications. (See McCandless, Tr at 930-935).

297. [* * *]

298. [* * *]

299. CX 103 is a compilation of documents PMC produced in this investigation which reflect litigation expenses, including examples of legal bills and bills

from consultants in the Weather Channel Litigation, as well as documents related to the contingent fee agreement with the attorneys who handled the case for the PMMC, (CX 103; McCandless, CX 7 at 17, Q48), although it does not contain all of the legal invoices which PMC received in connection with the Weather Channel litigation or the contingent fee agreements between PMC and the lawyers retained in connection with the Weather Channel litigation. (McCandless, Tr at 954).

300. CX 105 is a compilation of documents reflecting [*171] professional and consultant expenses incurred by PMMC and PMC. (CX 105; McCandless, CX 7 at 17, Q48).

301. CX 107 is a compilation of documents reflecting personnel expenses such as payroll, secretarial, labor and services. (CX 107; McCandless, CX 7, at 17, Q48).

302. CX 108 is a compilation of documents reflecting general overhead expenses. (CX 108; McCandless, CX 7, at 17, Q48).

303. CX 109 is a compilation of documents reflecting utility expenses incurred by the companies. (CX 109; McCandless, CX 7, at 17, Q48).

304. CX 110 is a compilation of documents reflecting miscellaneous expenses incurred by the companies, and includes receipts and invoices for travel, meals and other categories of expense not reflected in the other compilations. (CX 110; McCandless, CX 7, at 17, Q48).

305. CX 111 is a compilation of state and federal tax filings, (CX 111; McCandless, CX 7, at 17, Q48).

306. CX 117 is a compilation of documents reflecting PMMC and PMC's licensing revenue (CX 117, McCandless, CX 7 at 17, Q48), although it also contains material not reflecting PMC's licensing revenue. (See, CX 117 at PMC 280280-283; 292942).

307. McCandless testified that, although CX 103, 105, 107, [*172] 108, 109, 110, 111 and 117 do not represent all of the documents in PMC's possession relating to the expenses detailed in CX 102, 104 and 106, the compilations represent examples of such documents maintained by PMC among its records. (McCandless, CX 7, at 17-18, Q49-Q50).

308. McCandless testified that he is responsible for maintaining the records of PMC that are illustrated in the compilation exhibits CX 103, 105, 107, 108, 109, 110, 111 and 117. (McCandless, CX 7, at 17, Q49).

309. CX 112, 113, 114, 115 and 116 are PMC and PMMC bank account registers provide further backup for all of the expenses set forth in CX 102, 104 and 106 and illustrated by way of example in the compilation exhibits CX 103, 105, 107, 108, 109, 110, 111 and 117, (McCandless, CX 7, at 18, Q51), although not all of PMC's expenses set forth in CX 102, 104 and 106 are delineated in CX 112, 113, 114, 115, and 116. (McCandless, Tr 963-964; 967-968).

310. McCandless testified that every monetary expenditure PMMC and PMC made during the time period July, 1993 through March, 1997 is reflected in the bank registers CX 112, 113, 114, 115 and 116. (McCandless, CX 7, at 18, Q51).

H. Licensing Defense

311. [* * *] [*173]

312. The agreement of March 2, 1994, between complainant and StarSight provides that the SUBJECT PATENTS include the '501 application which issued as the '277 patent. (RX 18 at 19 and Schedule A thereto; RX 1216 at 19 of the agreement and Schedule A thereto; CX 10 at 19 and Schedule A thereto).

313. [* * *]

314. [* * *]

315. [* * *]

316. [* * *]
317. [* * *]

318. [* * *]

319. [* * *]

320. Jonathan Orlick, StarSight's counsel and designated 30(b)(6) witness, answered at his deposition, when asked if he would agree that StarSight cannot "license rights in the Harvey patents broader than the field of use," "yes." (RX 130, at p. 53).

321. [* * *]

322. [* * *]

323. StarSight has paid PMC for costs incurred in prosecuting patent coverage under the agreement. (RX 31; RX 32 at 3-4; CX 117 at PMC 292944).

324. PMC is in the process of renegotiating the StarSight license. (Metzger, Tr at 182; see, e.g. CX 33).

325. Of particular interest to StarSight during the negotiation of the 1994 agreement was the application that issued as the '277 patent. (Harvey, CX 9 at 12, Q29, Q30).

326. [* * *]

327. [* * *]

328. [* * *]

329. [* * *]

330. [* * *]

331. [* * *]

332. [* * *] [*174]

333. [* * *]

334. The agreement of March 2, 1994, between complainant and StarSight is still in effect. (Metzger, Tr 183; Harvey, 1112; RX 1205 at page 50).

335. [* * *]

336. [* * *]

337. On October 16, 1995, a PMMC/StarSight Modification, was executed and is currently in effect. (RX 1212 at 1; CX 11 at 1; Metzger Tr at 190-191; RX 1205 at 50).

338. [* * *]

339. The PMMC/StarSight Modification did not modify StarSight's FIELD OF USE granted under the Patent License Agreement between complainant and StarSight dated March 2, 1994. (RX 1212 pages 1-4; CX 11 pages 1-4),

340. The Modification to the Patent License Agreement between StarSight and PMMC, dated October 16, 1995 and having an effective date of October 1, 1995, authorized StarSight to sublicense rights to inventions disclosed in the Subject Patents that fall within the "field of use" granted to StarSight in 1994. (CX 11, RX 1206 at 2).

341. The PMMC/StarSight Modification authorized StarSight to sublicense rights in the '277 patent to Thomson under the terms and scope substantially the same as shown in Exhibit A to the PMMC/StarSight Modification. (RX 1212 page 2, CX 11 page 2; Metzger, Tr 191).

342. [* * *]

343. [* [*175] * *]

344. [* * *]

345. [* * *]

346. Claims 15, 35, 36 and 37 of the '277 patent read:

15. A method for identifying and selecting television programming in a system that is adapted to direct selected television programming to a television programming output or storage, said system including a processor for receiving and processing at least part of the television programming transmission, a means for transferring said programming selectively from a television programming receiver to a television programming output device or storage device, and a controller for receiving information from said processor and for controlling said means for transferring on the basis of at least some of said information, said method comprising the steps of:

inputting to said controller identification information of at least one specified television program unit;

inputting at least part of a television programming transmission to

said processor;

detecting, locating or identifying in said part identification data that identified a specific television program unit in said transmission; and

inputting information of said data to said controller, determining based on said program unit information [*176] that said specific unit is a specific unit and thereby to enable said controller to select at least a portion of said specific television program unit and cause said means for transferring to transfer information of said selected portion to said television programming output device or storage device.

35. A television subscriber station comprising:

a converter for receiving a multichannel television transmission;

a tuner operatively connected to said converter for selecting a specific television channel;

a television receiver or display device for displaying programming of a channel specified by said tuner; and

a controller operatively connected to said tuner for storing information of a selected television program unit and causing said tuner to select a television transmission containing programming of said selected television unit at a specific time.

36. The system of claim 35 also including:

a second controller operatively connected to said television receiver or display device for actuating or tuning said receiver or display device to receive or display the television programming of said selected transmission.

37. The system of claim 35 also [*177] including:

a video recorder connected to said converter; and

a second controller operatively connected to said video recorder for causing said recorder to record television programming of said selected transmission.

347. Claims 10 and 12 of the '277 patent read:

10. A television receiver system comprising:

a receiver for receiving a selected portion of a television program transmission that is not a standard television signal;

a digital detector operatively connected to said receiver for receiver said selected portion and detecting a digital signal;

a storage device operatively connected to said digital detector for receiving

detected digital information and assembling said detected information into message units;

a controller operatively connected to said receiver, said detector and said storage device, said controller controlling said receiver to pass selected information to said detector, said detector to pass detected information to said storage device, and said storage device to assemble detected information into message units.

12. A reprogrammable system comprising:

a digital detector for receiving information of a transmission and detecting [*178] digital signals in said transmission, said digital signals including new operating instructions;

a processor operatively connected to said digital detector for receiving and processing information of some of said digital signals, said processor identifying those of said operating instructions addressed to said processor, said processor instructing said detector to detect and pass specified signals;

a memory device operatively connected to said processor for holding operating instructions addressed to said processor, said operating instructions controlling the operation of said processor; and

said processor loading said operating instructions that are addressed to said processor into said memory device to thereby reprogram said processor, said operating instructions including instructions to cause said processor to cause said detector to detect different signals.

348. [* * *]

349. [* * *]

350. Ms. Metzger testified that she was involved in the negotiations with Thomson. (Metzger, Tr 190). However, Ms. Metzger testified:

Q. Are you aware of the terms of the license agreement between Thomson and StarSight that relates top the Harvey rights?

A. I've never seen [*179] the Thomson/StarSight agreement.

(Metzger, Tr 3453).

351. The first negotiation held between all three of PMC, StarSight and Thomson of the PMC related aspects of the Thomson/StarSight Agreement occurred in a three-way telephone conference between Ms. Metzger and Messrs. Klosterman and O'Hara in August 1995. (Metzger, Tr 3446).

352. Ms. Metzger was told by Thomson and StarSight officials that Thomson would not enter into a license for the StarSight-owned patents for electronic program guides without PMC also permitting StarSight to sublicense StarSight's rights in the PMC patents to Thomson. (Metzger, Tr 190-191, 3446).

353. [* * *]

354. [* * *]

355. [* * *]

356. [* * *]

357. [* * *]

358. PMC and Thomson have conducted negotiations over the past two years for a full license. (Metzger, Tr at 1991).

359. Metzger has talked to Thomson representatives O'Hara or Meyer 20 to 30 times. There have been several face-to-face meetings. PMC and Thomson representative have also met at trade shows. (Metzger, Tr at 1991).

360. The PMMC/StarSight Modification allowed StarSight to sublicense its full amount of patent rights which StarSight had under complainant's patents to Thomson. [*180] (RX1205 at pages 13-14).

361. The modification to the PMC/StarSight agreement [* * *]

362. The PMMC/StarSight Modification is still in effect. (Metzger, Tr 191; RX1205 at page 50).

363. [* * *]

364. [* * *]

365. [* * *]

366. [* * *]

367. [* * *]

368. The October 16, 1995 StarSight/Thomson agreement is still in effect. (RX1218 at 3).

369. [* * *]

370. [* * *]

371. [* * *]

372. [* * *]

I. Feature Films Venture Capital Proposal

373. Richard A. Davidson has a business address of Feature Film Services. He is an independent consultant in computers and electronics. (RX 1006 at 5, 6). Davidson wrote everything in a document titled "Proposed Capital Venture" (RX 1004) except letters over the signatures of other individuals and articles culled from other publications. (RX 1006 at 29). He finalized up through page 10 of RX 1004 in January 1977. Almost all of the remaining portion of RX 1004 was

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STATUS OF C...

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of	:		
John C. Harvey and James W. Cuddihy	:	Group Art Unit:	2602
Serial No.: 08/113,329	:	Examiner:	J. Groody
Filed: August 30, 1993	:	File No.:	5634/008

For SIGNAL PROCESSING APPARATUS AND METHODS

APPELLANTS' BRIEF (37 CFR § 1.192)

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GROUP 2600

Box Appeals and Interferences
Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

I. REAL PARTY IN INTEREST (37 CFR § 1.192(c)(1))

Appellants, John C. Harvey and James W. Cuddihy, are the inventors of the claimed subject matter at issue on appeal. The real party in interest is the assignee of the application, Personalized Media Communications, L.L.C.

II. RELATED APPEALS AND INTERFERENCES (37 CFR § 1.192(c)(2))

There are no related appeals or interferences known to Appellants' legal representative which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal. Nevertheless, Appellants expect the issues raised by this appeal to be important in the ultimate disposition of other co-pending applications.

[illegible] Notwithstanding this, however, the district court held that Studiengesellschaft Kohle had not violated or exceeded the time period limits provided by the patent statute. Id. at 356. The Federal Circuit, therefore, affirmed the lower court's decision. Id.

A recent decision of this Board, Ex parte Hyatt, No. 91-0984 (March 16, 1992)(Ex. 1), has also followed the Federal Circuit's lead. Notwithstanding a delay of nine years between the filing of the continuation application and the original filing, the Board held that "the Appellant has done what is provided for in the statute and relevant rules and practice of the [PTO] in filing the present continuing application. **35 U.S.C. Section 120 does not place a time limit on filing the continuing application.** Rather, all that is required to preserve an earlier effective filing date as to common subject matter is copendency or a continuous chain of copendency." Id. at 8. (emphasis added). Accordingly, the Board reversed the rejection of claims on the basis of purported pre-issuance laches. Id. at 9.

The case law makes clear that the only relevant inquiry concerning claims filed in a subsequent continuation application pursuant to Section 120 is whether they are adequately supported in under Section 112, first paragraph, in the initial application. If the support exists, the inquiry is at an end. The Office Action's statement that "there is no apparent reason why applicants were prevented from presenting claims corresponding to those of the instant application during prosecution of the parent applications which matured into patents", Office Action at

Respectfully submitted,

Dated: September 13, 1996

Thomas J. Scott

113329

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§ 10.85 Representing a client within the bounds of the law.

(a) In representation of a client, a practitioner shall not:

(1) Initiate or defend any proceeding before the Office, assert a position, conduct a defense, delay a trial or proceeding before the Office, or take other action on behalf of the practitioners client when the practitioner knows or when it is obvious that such action would serve merely to harass or maliciously injure another.

(2) Knowingly advance a claim or defense that is unwarranted under existing law, except that a practitioner may advance such claim or defense if it can be supported by good faith argument for an extension, modification, or reversal of existing law.

(3) Conceal or knowingly fail to disclose that which the practitioner is required by law to reveal.

(4) Knowingly use perjured testimony or false evidence.

(5) Knowingly make a false statement of law or fact.

(6) Participate in the creation or preservation of evidence when the practitioner knows or it is obvious that the evidence is false.

(7) Counsel or assist a client in conduct that the practitioner knows to be illegal or fraudulent.

(8) Knowingly engage in other illegal conduct or conduct contrary to a Disciplinary Rule.

(b) A practitioner who receives information clearly establishing that:

(1) A client has, in the course of the representation, perpetrated a fraud upon a person or tribunal shall promptly call upon the client to rectify the same, and if the client refuses or is unable to do so the practitioner shall reveal the fraud to the affected person or tribunal.

(2) A person other than a client has perpetrated a fraud upon a tribunal shall promptly reveal the fraud to the tribunal.

Added 50 FR 5180, Feb. 6, 1985, effective Mar. 8, 1985

§ 1.56 Duty to disclose information material to patentability.

(a) A patent by its very nature is affected with a public interest. The public interest is best served, and the most effective patent examination occurs when, at the time an application is being examined, the Office is aware of and evaluates the teachings of all information material to patentability. Each individual associated with the filing and prosecution of a patent application has a duty of candor and good faith in dealing with the Office, which includes a duty to disclose to the Office all information known to that individual to be material to patentability as defined in this section. The duty to disclose information exists with respect to each pending claim until the claim is cancelled or withdrawn from consideration, or the application becomes abandoned. Information material to the patentability of a claim that is cancelled or withdrawn from consideration need not be submitted if the information is not material to the patentabilityof any claim remaining under consideration in the application. There is no duty to submit information which is not material to the patentability of any existing claim. The duty to disclose all information known to be material to patentability is deemed to be satisfied if all information known to be material to patentability of any claim issued in a patent was cited by the Office or submitted to the Office in the manner prescribed by 1.97(b)-(d) and 1.98. However, no patent will be granted on an application in connection with which fraud on the Office was practiced or attempted or the duty of disclosure was violated through bad faith or intentional misconduct. The Office encourages applicants to carefully examine:

(1) Prior art cited in search reports of a foreign patent office in a counterpart application, and

(2) The closest information over which individuals associated with the filing or prosecution of a patent application believe any pending claim patentably defines, to make sure that any material information contained therein is disclosed to the Office.

(b) Under this section, information is material to patentability when it is not cumulative to information already of record or being made of record in the application, and

(1) It establishes, by itself or in combination with other information, a prima facie case of unpatentability of a claim; or

(2) It refutes, or is inconsistent with, a position the applicant takes in:

(i) Opposing an argument of unpatentability relied on by the Office, or

(ii) Asserting an argument of patentability.

A prima facie case of unpatentability is established when the information compels a conclusion that a claim is unpatentable under the preponderance of evidence, burden-of-proof standard, giving each term in the claim its broadest reasonable construction consistent with the specification, and before any consideration is given to evidence which may be submitted in an attempt to establish a contrary conclusion of patentability.

(c) Individuals associated with the filing or prosecution of a patent application within the meaning of this section are:

(1) Each inventor named in the application;

(2) Each attorney or agent who prepares or prosecutes the application; and
(3) Every other person who is substantively involved in the preparation or prosecution of the application and who is associated with the inventor, with the assignee or with anyone to whom there is an obligation to assign the application.
(d) Individuals other than the attorney, agent or inventor may comply with this section by disclosing information to the attorney, agent, or inventor.
42 FR 5593, Jan. 28, 1977; paras. (d) (e) - (i), 47FR 21751, May 19, 1982, effective July 1, 1982; para. (c), 48 FR 2710, Jan. 20, 1983, effective Feb. 27, 1983; paras. (b) and (j), 49 FR 554, Jan. 4, 1984, effective Apr. 1, 1984; paras. (d) and (h), 50 FR 5171, Feb. 6, 1985, effective Mar. 8, 1985; para. (e), 53 FR 47808, Nov. 28, 1988, effective Jan. 1, 1989; 57 FR 2021, Jan. 17, 1992, effective Mar. 16, 1992

NAUT

Comparison of claim 11 from Serial No. 08/477,805 to claim 25 from Serial No. 08/449,523. SEXT

Claim 11	Claim 25
A method of controlling a remote television transmitter station to communicate television program material to one or more receiver stations, with said remote television transmitter station including a broadcast or cablecast transmitter for transmitting one or more units of television programming, a plurality of selective transmission devices each operatively connected to said broadcast or cablecast transmitter for communicating a unit of television programming, a television receiver, a control signal detector, and a controller or computer capable of controlling one or more of said selective transmission devices, and with said remote transmitter station adapted to detect the presence of one or more control signals, to control the communication of specific units of television programming in response to detected specific control signals, and to deliver at	A method of controlling a remote television transmitter station to communicate television program material to one or more receiver stations, with said remote television transmitter station including a broadcast or cablecast transmitter for transmitting one or more units of television programming, a plurality of selective transmission devices each operatively connected to said broadcast or cablecast transmitter for communicating a unit of television programming, a television receiver, a control signal detector, and a controller or computer capable of controlling one or more of said selective transmission devices, and with said remote transmitter station adapted to detect the presence of one or more control signals, to control the communication of specific units of television programming in response to detected specific control signals, and to deliver at

its broadcast or cablecast transmitter one or more units of television programming, said method of communicating comprising the steps of:

(1) receiving a unit of television programming to be transmitted by the remote intermediate television transmitter station and delivering said unit of television programming to a transmitter;

(2) receiving one or more control signals which at the remote intermediate television transmitter station operate to control the communication of ***a specific one or more of said plurality of units*** of television programming; and

(3) transmitting said one or more control signals to said transmitter before a specific time.

its broadcast or cablecast transmitter one or more units of television programming, said method of communicating comprising the steps of:

(1) receiving a unit of television programming to be transmitted by the remote intermediate television transmitter station and delivering said unit of television programming to a transmitter, ***said unit of television programming having an instruct signal which is effective at the one or more receiver stations to implement a television signalling scheme***;

(2) receiving one or more control signals which at the remote intermediate television transmitter station operate to control the communication of ***said unit*** of television programming; and

(3) transmitting said one or more control signals to said transmitter before a specific time.

NAV

Comparison of claim 12 from Serial No. 08/469,626 to claim 24 from Serial No. 08/487,980.

Claim 12

A method of controlling a remote intermediate mass medium programming transmitter station to communicate mass medium program material to one or more receiver stations, with said remote transmitter station including a broadcast or cablecast transmitter for transmitting one or more units of mass medium programming, a plurality of selective transmission devices each operatively connected to said broadcast or cablecast transmitter for communicating a unit of mass medium programming, a mass medium programming receiver, a control signal detector, and a controller or computer capable of controlling one or more of said selective transmission devices, and with said remote transmitter station adapted to detect the presence of one or more control signals, to control the communication of specific units of mass medium programming in response to detected specific

Claim 24

A method of controlling a remote intermediate mass medium programming transmitter station to communicate mass medium program material to one or more receiver stations, with said remote transmitter station including a broadcast or cablecast transmitter for transmitting one or more units of mass medium programming, a plurality of selective transmission devices each operatively connected to said broadcast or cablecast transmitter for communicating a unit of mass medium programming, a mass medium programming receiver, a control signal detector, and a controller or computer capable of controlling one or more of said selective transmission devices, and with said remote transmitter station adapted to detect the presence of one or more control signals, to control the communication of specific units of mass medium programming in response to detected specific

control signals, and to deliver at its broadcast or cablecast transmitter one or more units of mass medium program, said method of communicating comprising the steps of:

(1) receiving a unit of mass medium programming to be transmitted by the remote intermediate mass medium programming transmitter station and delivering said unit of mass medium programming to a transmitter, said unit of mass medium programming having an instruct signal which is effective at the one or more receiver stations to ***control a sequence of events***;

(2) receiving one or more control signals which at the remote intermediate mass medium programming transmitter station operate to control the communication of said unit of mass medium programming; and

(3) transmitting said one or more control signals to said

control signals, and to deliver at its broadcast or cablecast transmitter one or more units of mass medium program, said method of communicating comprising the steps of:

(1) receiving a unit of mass medium programming to be transmitted by the remote intermediate-mass medium programming transmitter station and delivering said unit of mass medium programming to a transmitter, said unit of mass medium programming having an instruct signal which is effective at the one or more receiver stations to ***decode a portion of a multichannel broadcast or cablecast transmission***;

(2) receiving one or more control signals which at the remote intermediate mass medium programming transmitter station operate to control the communication of said unit of mass medium programming; and

(3) transmitting said one or more control signals to said

transmitter before a specific time.

transmitter before a specific time.

Comparison of claim 24 from Serial No. 08/488,620 to claim 23 from Serial No. 08/477,660. HEAD

Claim 24	Claim 23
A method of controlling a computer to communicate a television signal in a television network, said network ***having*** a television transmitter station and a television receiver station, said receiver station having a computer for communicating of television signals, said method comprising the steps of:	A method of controlling a computer to communicate a television signal in a television network, said network ***comprised of*** a television transmitter station and a television receiver station, said receiver-station having a computer for communicating of television signals, said method comprising the steps of:
programming ***said receiver station*** to search for data embedded in a television signal;	programming ***a processor*** to search for data embedded in a television signal;
inputting an identifier code that designates a unit of computer software;	inputting an identifier code that designates a unit of computer software;
storing a television signal on a file storage medium at a storage device associated with said computer;	storing a television signal on a file storage medium at a storage device associated with said computer;
receiving from a remote source an information transmission that contains a control signal;	receiving from a remote source an information transmission that contains a control signal;

selecting a storage location associated with said computer in response to said control signal;

transferring said unit of computer software to said storage device;

storing said unit of software on said file storage medium;

executing a technique for communicating a file stored on a disk associated with a computer; and

communicating said television signal in accordance with said technique.

selecting a storage location associated with said computer in response to said control signal;

transferring said unit of computer software to said storage device ***and***

storing said unit of software on said file storage medium,

thereby to enable said computer to execute a technique for communication a file stored on a disk associated with a computer and

communicate said television signal in accordance with said technique.

Comparison of claim 23 from Serial No. 08/488,032 to claim 58 from Serial No. 08/451,746.

Claim 23	Claim 58
A method of communicating subscriber station information from a subscriber station to one or more remote data collection stations, said method comprising the steps of:	A method of communicating subscriber station information from a subscriber station to one or more remote data collection stations, said method comprising the steps of:
(1) inputting a viewer's or participant's reaction at a subscriber station;	(1) inputting a viewer's or participant's reaction at a subscriber station;
(2) receiving at said subscriber station information that designates an instruct signal to process or an output to deliver in consequence of subscriber input;	(2) receiving at said subscriber station information that designates an instruct signal to process or an output to deliver in consequence of ***said specific*** subscriber input;
(3) determining the presence of said subscriber input at said subscriber station by processing said viewer's or participant's reaction;	(3) determining the presence of said ***specific*** subscriber input at said subscriber station by processing said viewer's or participant's reaction;
(4) processing an instruct signal which is effective to ***coordinate data processing with communication or presentation of*** television programming at said	(4) processing an instruct signal which is effective to ***receive, generate, or present output to supplement*** television

subscriber station in consequence of said step of determining; and

(5) transferring from said subscriber station to one or more remote data collection stations an indicia confirming delivery of said instruct signal from said step of processing or confirming delivery of said effect from said step of processing.

programming at said subscriber station in consequence of said step of determining; and

(5) transferring from said subscriber station to one or more remote data collection stations an indicia confirming delivery of said instruct signal from said step of processing or confirming delivery of said effect from said step of processing.

Comparison of claim 47 from Serial No. 08/469,106 to claim 46 from Serial No. 08/487,649.

Claim 47	Claim 46
A method of controlling at least one of a plurality of receiver stations each of which includes a broadcast or cablecast mass medium program receiver, at least one output device, a control signal detector, at least one processor capable of responding to an instruct signal, and with each said mass medium program receiver station adapted to detect and respond to one or more instruct signals, said method of communicating comprising the steps of:	A method of controlling at least one of a plurality of receiver stations each of which includes a broadcast or cablecast mass medium program receiver, at least one output device, a control signal detector, at least one processor capable of responding to an instruct signal, and with each said mass medium program receiver station adapted to detect and respond to one or more instruct signals, said method of communicating comprising the steps of:
(1) receiving at a broadcast or cablecast transmitter station an instruct signal which is effective at the receiver station to ***implement a scheme for generating a control signal*** and delivering the instruct signal to a transmitter;	(1) receiving at a broadcast or cablecast transmitter station an instruct signal which is effective at the receiver station to ***select a broadcast or cablecast signalling scheme and generate a signal in consequence of said selected broadcast or cablecast signalling scheme*** and delivering the instruct signal to a transmitter;
(2) receiving at said transmitter station one or more	(2) receiving at said

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control signals which at the receiver station operate to communicate the instruct signal to a specific processor; and

(3) transferring said one or more control signals to the transmitter, said transmitter transmitting the instruct signal and the one or more control signals.

transmitter station one or more control signals which at the receiver station operate to communicate the instruct signal to a specific processor; and

(3) transferring said one or more control signals to the transmitter, said transmitter transmitting the instruct signal and the one or more control signals.

2001.06(b) Information Relating to or From Copending United States Patent Applications

The individuals covered by 37 CFR 1.56 have a duty to bring to the attention of the examiner, or other Office official involved with the examination of a particular application, information within their knowledge as to other copending United States applications which are "material to patentability" of the application in question. As set forth by the court in Armour & Co. v. Swift & Co., 466 F.2d 767, 779, 175 USPQ 70, 79 (7th Cir. 1972):

[W]e think that it is unfair to the busy examiner, no matter how diligent and well informed he may be, to assume that he retains details of every pending file in his mind when he is reviewing a particular application . . . [T]he applicant has the burden of presenting the examiner with a complete and accurate record to support the allowance of letters patent.

See also MPEP § 2004, paragraph 9.

Accordingly, the individuals covered by 37 CFR 1.56 cannot assume that the examiner of a particular application is necessarily aware of other applications "material to patentability" of the application in question, but must instead bring such other applications to the attention of the examiner. For example, if a particular inventor has different applications pending in which similar subject matter but patentably indistinct claims are present that fact must be disclosed to the examiner of each of the involved applications. Similarly, the prior art references from one application must be made of record in another subsequent application if such prior art references are "material to patentability" of the subsequent application.

Normally, if the application under examination is identified as a continuation or continuation-in-part of an earlier application, the examiner will consider the prior art cited in the earlier application. The examiner must indicate in the first Office action whether the prior art in a related earlier application has been reviewed. Accordingly, no separate citation of the same prior art need be made in the later application.

2001.06(c) Information From Related Litigation.

Where the subject matter for which a patent is being sought is or has been involved in litigation, the existence of such litigation and any other material information arising therefrom must be brought to the attention of the Patent and Trademark Office. Examples of such material information include evidence of possible prior public use or sales, questions of inventorship, prior art, allegations of "fraud," "inequitable conduct," and "violation of duty of disclosure." Another example of such material information is any assertion that is made during litigation which is contradictory to assertions made to the examiner. Environ Prods., Inc. v. Total Containment, Inc., 43 USPQ2d 1288, 1291 (E.D. Pa. 1997). Such information might arise during litigation in, for example, pleadings, admissions, discovery including interrogatories, depositions, and other documents and testimony.

Where a patent for which reissue is being sought is, or has been, involved in litigation which raised a question material to examination of the reissue application, such as the validity of the patent, or any allegation of "fraud," "inequitable conduct," or "violation of duty of disclosure," the existence of such litigation must be brought to the attention of the Office by the applicant at the time of, or shortly after, filing the application, either in the reissue oath or declaration, or in a separate paper, preferably accompanying the application, as filed. Litigation begun after filing of the reissue application should be promptly brought to the attention of the Office. The details and documents from the litigation, insofar as they are "material to patentability" of the reissue application as defined in 37 CFR 1.56, should accompany the application as filed, or be submitted as promptly thereafter as possible. See Critikon, Inc. v. Becton Dickinson Vascular Access, Inc., 120 F.3d 1253, 1258, 1259, 43 USPQ2d 1666, 1670-71 (Fed. Cir. 1997) (patent held unenforceable due to inequitable conduct based on patentee's failure to disclose a relevant reference and for failing to disclose ongoing litigation).
For example, the defenses raised against validity of the patent, or charges of "fraud" or "inequitable conduct" in the litigation, would normally be "material to the examination" of the reissue application. It would, in most situations, be appropriate to bring such defenses to the attention of the Office by filing in the reissue application a copy of the court papers raising such defenses. As a minimum, the applicant should call the attention of the Office to the litigation, the existence and the nature of any allegations relating to validity and/or "fraud," or "inequitable conduct" relating to the original patent, and the nature of litigation materials relating to these issues. Enough information should be submitted to clearly inform the Office of the nature of these issues so that the Office can intelligently evaluate the need for asking for further materials in the litigation. See MPEP § 1442.04

Examiner Initial	Author, Title, Date, Pertinent Pages, Etc.
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	Lopinto, John, "The Application of DRCS within the North American Broad cast Teletext Specification", IEEE Transactions on Consumer Electronics (1982), pp. 612-617
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	Various Commissioner statements on Authorization of Teletext Transmissions by TV Stations, BC Docket No. 81-741
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Jan. 17, 1956 C. A. PARKER ET AL 2,731,197

PIN BOX CONTROL MECHANISM

Original Filed June 14, 1949 3 Sheets-Sheet 1

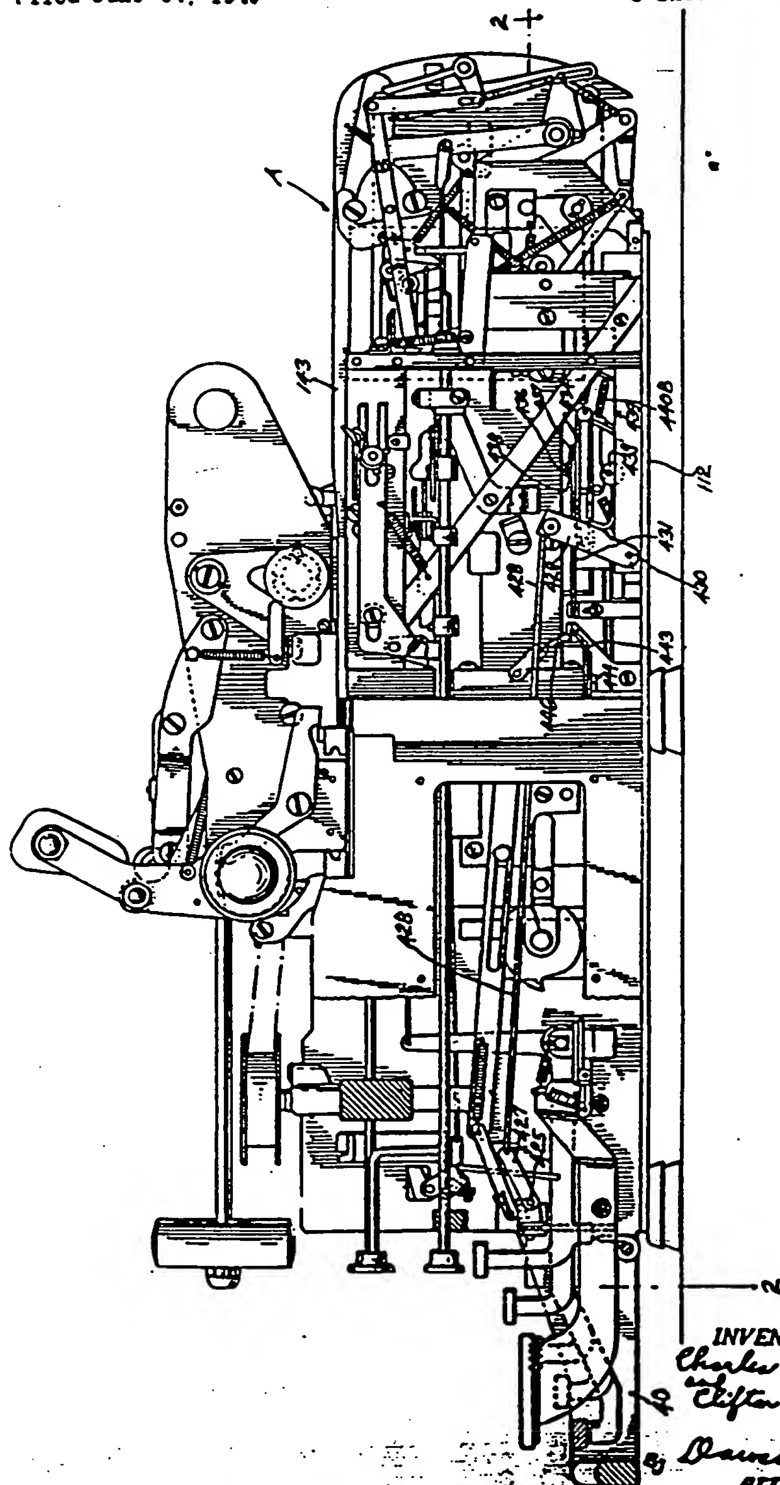

Fig. 1

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Bee Hive.

No. 33,189.

Patented Sept. 3, 1861.

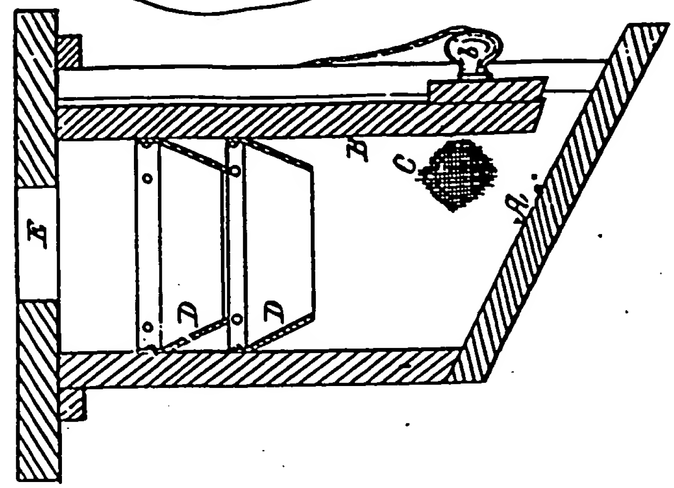

Fig. 2.

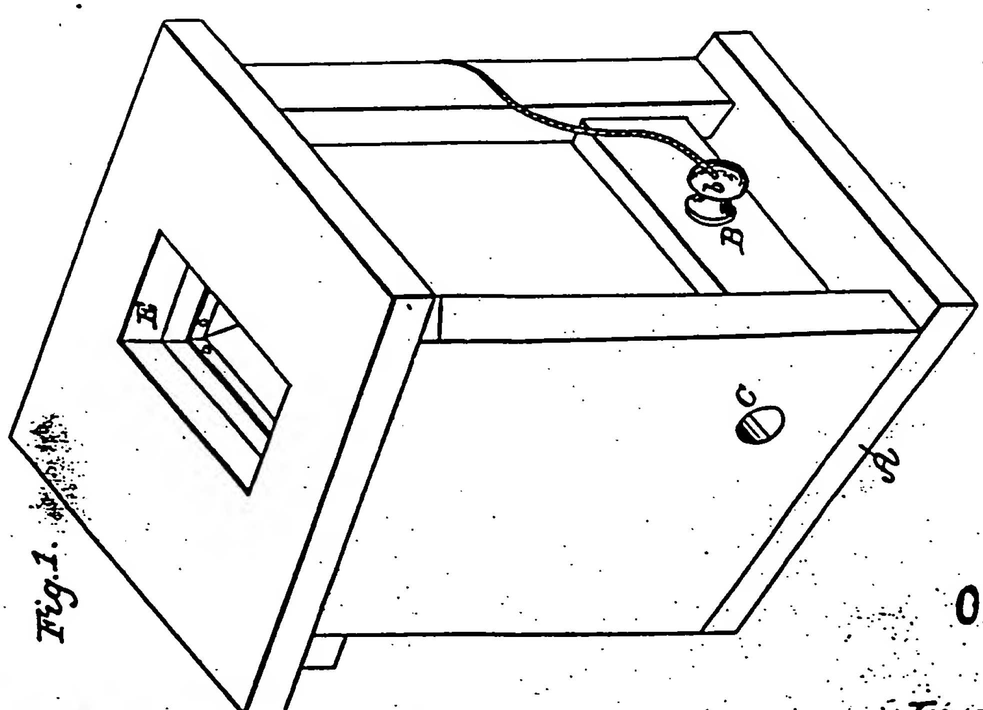

Fig. 1.

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United States Patent [19]
Oh

[11] Patent Number: 4,473,068
[45] Date of Patent: Sep. 25, 1984

[54] TROCHANTERIC BASKET

[76] Inventor: Indong Oh, 851 Lyndon St., South Pasadena, Calif. 91030

[21] Appl. No.: 340,025

[22] Filed: Jan. 18, 1982

[51] Int. Cl.³ A61F 5/04
[52] U.S. Cl. .... 128/92 D; 128/92 R
[58] Field of Search .... 128/92 D, 92 R, 92 C, 128/92 B

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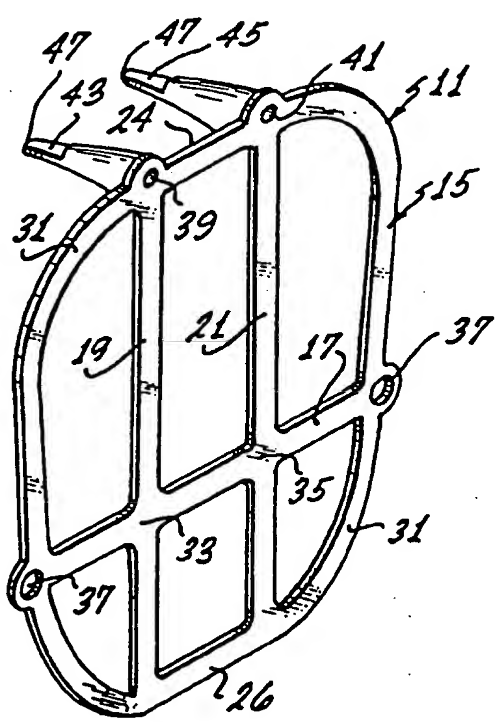
Primary Examiner—C. Fred Rosenbaum
Assistant Examiner—C. W. Shedd
Attorney, Agent, or Firm—Gordon L. Peterson

[57] ABSTRACT

An implant for use in retention of the greater trochanter comprising a circumferentially extending band and first and second bands extending between opposite regions of the circumferentially extending band. One or more prongs are coupled to the bands. The implant cooperates with a wire for tying the implant in position over the greater trochanter. The bands of the implant are deformable so that they can be conformed to approximate the contour of the greater trochanter. The prongs are adapted to penetrate the abductor muscle-tendon attached to the greater trochanter to help retain the greater trochanter in position.

17 Claims, 6 Drawing Figures



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ENUMERATED LIST OF THE 328 APPLICATIONS PLUS THE '329 PARENT

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1	397371	2	397582	3	397636
4	435757	5	435758	6	437044
7	437045	8	437629	9	437635
10	437791	11	437819	12	437864
13	437887	14	437937	15	438011
16	438206	17	438216	18	438659
19	439668	20	439670	21	440657
22	440837	23	441027	24	441033
25	441575	26	441577	27	441701
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325	488620	326	498002	327	511491
328	485773	329	113329		

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REMARKS

The Office Action dated February 6, 1997 has been carefully reviewed . In response thereto, claims 56-88 have been amended. Claims 89-92 have been added. Claims 56-92 remain active in the application. Claims 67, 75, 80 and 84 stand objected to for various informalities. Claims 56-88 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. Claims 56-83 stand rejected under 35 U.S.C. § 102(b). Claim 75-79, 81, 83, 84-88 stand rejected under 35 U.S.C. § 103(a). Claims 56-88 are rejected under the judicially created doctrine of non-obviousness non-statutory double patenting and under the judicially created doctrine of double patenting.

The present application claims priority under 35 U.S.C. § 120 of the following applications:

Serial No.	Filing Date	Patent No.
08/113,329	August 30, 1993	Pending
08/056,501	May 3, 1993	5,335,277
07/849,226	March 10, 1992	5,233,654
07/588,126	September 25, 1990	5,109,414
07/096,096	September 11, 1987	4,965,825
06/829,531	February 14, 1986	4,704,725
06/317,510	November 3, 1981	4,694,490

Consequently, Applicants will demonstrate disclosure only with respect to the '81 case, App. Ser. No. 06/317,510 and issued as U.S. Pat. No. 4,694,490.

Applicants have amended the pending claims in response to the Examiner's various rejections, objections and queries. Applicants believe that all pending claims clearly define the metes and bounds of the claimed subject matter, and are supported by adequate written description that is fully enabling.

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a transmission that contains a *discrete signal* of downloadable code and a series of video images that each contain at least one *graphic image*. The downloadable code and the series of vide images being an example of the refining elements in claim 60. Both, claims 24 and 48 recite that the discrete signal and the discrete signal of downloadable code, respectively, designates processor instructions, which control various claimed steps.

Applicants conclude that the claims added in the response dated 10/3/97 are simply a refinement of claims treated in the previous office action response. Therefore, Applicants submit that as the claims are merely refinements of either claims 24, 33, 38, or 42, or combinations thereof, the prior art of record does not anticipate or make obvious the new claims. See discussion of the rejection of claims 24 and 38 by Campbell '791 and Gimple '731 respectively. Applicants therefore submit that this constitutes a proper response under 32 C.F.R. 1.111 and 1.119.

E. Response to Rejections under 35 U.S.C. § 112

1. Specification Support of Claims 24-32, 38-41, 45, and 47-63

Paragraph 8 of the Final Office Action rejects claims 24-32, 38-41, 45, and 47-63 under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention.

The following tables list Applicants' claim language in the left column which corresponds to the specification support in the right column.

As a general matter, as it is today, "Wall Street Week" was in 1981 a well known Public Broadcasting System program that originated in Owings Mills, Maryland and was rebroadcast all over the United States. The "television studio originating ['Wall Street Week']" is disclosed at col. 19 lines 61-62. As an "[illustration of] one instance of ... the use of Signal Processing Apparatus and Methods ... a cable television system ... that cablecasts several channels of television programming" is disclosed at col. 10 lines 24-28. Among the "programming being cablecast on the multi-channel system ... 'Wall Street Week' is being televised on channel X." (col. 19 lines 14-23)

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4 this ~~paragraph~~ paragraph does not exist in the instant disclose...

TUESDAY, DECEMBER 19, 2000, 12:15 p.m.

IP SUITS -- U.S. Court of Appeals for the Federal Circuit (brief is on IPO website under IP in the Courts):

IPO Files Brief on "Prosecution Laches" in Symbol Technologies v. Lemelson Case -- Symbol Technologies v. Lemelson Medical, Education & Research Foundation, Limited Partnership 00-1583 -- On Dec. 18 IPO filed a friend-of-the-court brief in support of Symbol Technologies' appeal of whether courts have equitable power to deny enforcement of a patent for unjustifiable delay during USPTO prosecution of the application. IPO's brief concludes courts have such power where the patent holder has unjustifiably delayed the filing of its claims to the detriment of innocent parties who were lawfully practicing the invention after it was disclosed to the public and in general use. The equitable doctrine at issue is called "prosecution laches." IPO argues the U.S. Supreme Court applied the doctrine in the1924 Webster Electric case, and that case has not been overruled by court decision or statute. Although the new patent term that expires 20 years after filing ameliorates problems with delay in applications filed after June 8, 1995, the brief notes, numerous pending applications were filed before that date. The brief also notes that situations arise in which long delays are justifiable and IPO takes no position on whether delays in the Symbol Technologies case were justifiable.

UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT

Appeal No. 00-1583

SYMBOL TECHNOLOGIES, INC., et al.

Plaintiffs-Petitioners

v.

LEMELSON MEDICAL, EDUCATION & RESEARCH
FOUNDATION, LIMITED PARTNERSHIP,

Defendant-Respondent.

COGNEX CORPORATION,

Plaintiff-Petitioner,

v.

LEMELSON MEDICAL, EDUCATION & RESEARCH
FOUNDATION, LIMITED PARTNERSHIP,

Defendant-Respondent.

BRIEF OF INTELLECTUAL PROPERTY OWNERS ASSOCIATION AS *AMICUS CURIAE* IN SUPPORT OF APPEAL

December 18, 2000	George L. Graff Paul, Hastings, Janofsky & Walker LLP *Attorneys for Amicus Curiae* *Intellectual Property Owners Association* 75 East 55th Street New York, New York 10022 Telephone: (212) 318-6000
Of Counsel: Adam E. Kraidin	

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CERTIFICATE OF INTEREST

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CERTIFICATE OF INTEREST

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UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

Symbol Technologies, Inc., et al. v. Lemelson Medical, Education & Research Foundation, Limited partnership

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Cognex Corporation v. Lemelson Medical, Education & Research Foundation, Limited Partnership

No. 00-1583

Counsel for the *Amicus Curiae* Intellectual Property Owners Association certifies the following:

1. The full names of every party or *amicus* represented by me is:

   Intellectual Property Owners, Inc.
   d/b/a Intellectual Property Owners Association

2. The name(s) of the real party in interest (if the party named in the caption is not the real party in interest) represented by me is:

   NONE

3. All parent corporation(s) and any publicly held companies that own 10 percent or more of the stock of *amicus curiae* represented by me are:

   NONE

4. The names of all law firms and the partners or associates that appeared for the *amicus curiae* now represented by me in the trial court or agency or are expected to appear in this Court are:

   Paul, Hastings, Janofsky & Walker LLP
   George L. Graff and Adam E. Kraidin

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35 U.S.C. § 120

35 U.S.C. § 282 (1), (4)

Pub. L. 103-465, § 534

LEGISLATIVE HISTORY

H.R.Rep.No.1923, 82nd Cong., 2d Sess. 7 (1952)

S.Rep.No.1979, 82nd Cong., 2d. Sess. 6 (1952)

The Intellectual Property Owners Association ("**IPO**") submits this brief as an *amicus curiae* pursuant to Fed. R. App. P. 29(a) and Rule 29(a) of this Court, in support of the appeal of plaintiffs-appellants Symbol Technologies, Inc. et al., and plaintiff-appellant Cognex Corporation (collectively, "**Plaintiffs**") seeking reversal of the March 21, 2000 Order of the Honorable Philip M. Pro of the United States District Court for the District of Nevada dismissing Plaintiffs' claims for a declaratory judgment that certain patents owned by defendant-appellee Lemelson Medical, Education & Research Foundation, L.P., (the "**Partnership**") are unenforceable against Plaintiffs by

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virtue of the allegedly unreasonable and prejudicial delay of the Partnership and its founder, Jerome Lemelson, in prosecuting the applications for those patents in the United States Patent and Trademark Office ("**PTO**").

INTEREST OF AMICUS CURIAE

IPO is a non-profit, tax-exempt, national organization of nearly 100 large and mid-sized companies and 200 small businesses, universities, inventors, authors, executives, and attorneys. Founded in 1972, IPO represents the interests of all owners of intellectual property, as well as a broad range of interests in ownership, including manufacturers, parties to licenses and agreements, and people generally interested in patents, trademarks, copyrights, and trade secrets. The filing of this brief was approved by the IPO Board of Directors, the members of which are listed in the appendix.(1)

The association generally adheres to a policy of submitting amicus briefs on significant issues affecting its members. Because of the perceived threat to the fundamental principles which underlie the patent laws, IPO has authorized the filing of this brief urging this Court to rule that, where a patentee has unjustifiably delayed filing claims until after an invention has been publicly disclosed and entered into general use, the courts have the equitable power to deny enforcement of the patent against parties who were practicing the invention prior to the filing of the claims. It should be understood that situations arise in which long delays are justifiable, and IPO takes no position on whether the delays in this case were justifiable.

INTRODUCTION

This appeal raises the issue of whether Congress, by the enactment of 35 U.S.C. 120, completely eliminated the equitable power of the federal courts to deny enforcement to a patent where (1) the patent holder had unreasonably and unjustifiably delayed the prosecution of the patent

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until after the invention was widely known and in general use and (2) the alleged infringer had been lawfully practicing the invention prior to the patent holder's filing of the claims. Plaintiffs allege that the

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Plaintiffs sought, among other things, a declaratory judgment that laches barred enforcement of those claims. The district court, however, adopted the reasoning of one of its earlier opinions that "the court should not intervene in equity to regulate what Congress has not" (*see Ford Motor Co. v. Lemelson*, 42 U.S.P.Q 2d 1706, 1707 (1997)) and held that it lacked the power even to consider a laches defense and dismissed it as a matter of law.

Although the problems addressed in this case have been ameliorated, at least for patents based on applications filed after June 8, 1995, by the Uruguay Round Agreements Act (Pub. L. 103-465, 534), which generally limits the duration of patents until 20 years after the filing of the initial

application, there are still numerous applications pending which may potentially be subject to a laches defense. Accordingly, the IPO submits this *amicus curiae* brief seeking a reversal of the district court's Order and remand of the case for a determination of the merits of the Plaintiffs' claims.

SUMMARY OF ARGUMENT

In the decades prior to the enactment of the Patent Act of 1952 (the "**Patent Act**"), the Supreme Court had recognized and repeatedly reaffirmed the defense of patent prosecution laches as an appropriate exercise of a court's equitable power to prevent abusive conduct which threatened the integrity of the patent system. The laches defense enables courts to deny enforcement

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to patents where the applicant has unjustifiably delayed in filing patent claims until after the invention

has been publicly disclosed and has fallen into general public use.

The considerations underlying the Supreme Court's recognition of the laches defense are, if anything, stronger in today's environment of rapid technological change then they were in the early part of the Twentieth century; and neither the express language of the Patent Act nor its legislative history indicates that Congress intended to overrule established Supreme Court precedent so as to limit the courts' inherent equitable power in this area.

ARGUMENT

The Courts Have Equitable Power to Deny Enforcement to Patents Based on Unjustifiable and Prejudicial Delay in Prosecution

Since 1923, the Supreme Court has recognized the defense of prosecution laches as an appropriate exercise of the equitable power of the courts in order to further the policies of the patent law by preventing the unfair expansion of the exclusive rights granted to patent holders. Neither the language nor the legislative history of the Patent Act, which codifies the common law practice of permitting applicants to file continuation applications without losing the benefit of their original filing

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1. The Doctrine of Prosecution Laches Safeguards Fundamental Policies of the Patent Law.

The conduct alleged in Plaintiffs' complaint is fundamentally inconsistent with at least two underlying policies of the patent law: (1) the Constitutional mandate that the period of exclusivity granted to inventors exist only for "limited Times"; and (2) the policy against removing existing knowledge from the public domain after it has come into general public use.

Article I, Section 8 of the United States Constitution grants Congress the power "To

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Article I, Section 8 of the United States Constitution grants Congress the power "To

promote the Progress of Science and useful Arts, by securing *for limited Times* to Authors and Inventors the exclusive Right to their respective Writings and Discoveries." (Emphasis added). This language reflects a recognition, from the earliest days of our Republic, that:

> the patent system represents a carefully crafted bargain that encourages both the creation and the public disclosure of new and useful advances in technology, in return for an exclusive monopoly for *a limited period of time*.

Pfaff v. Wells Electronic, Inc., 525 U.S. 55, 63 (1998) (emphasis added).

The federal courts crafted the defense of prosecution laches as a response to abuses of the patent application process which undermined these fundamental policies by unjustifiably extending the term of a patent holder's limited period of exclusivity. *See, e.g., Woodbridge v. United States*, 263 U.S. 50, 44 S. Ct. 45 (1923); *Webster Electric Co. v. Splitdorf Electrical Co.*, 264 U.S. 463, 44 S. Ct. 342 (1924); *Vitamin Technologists, Inc. v. Wisconsin Alumni Research Foundation*, 146 F.2d 941 (9th Cir. 1945); *Wirebounds Patents Co. v. Saranac Automatic Machine Corp.*, 65 F.2d 904 (6th Cir. 1933). These cases clearly establish the principle that courts may use their inherent equitable power to refuse to enforce a patent when the facts show that the patent holder had broken its "bargain" by unreasonably and unjustifiably delaying the time when the public could freely use the invention.

In *Woodbridge*, for example, the inventor had deliberately caused the PTO to delay the issuance of his patent for 9 years for the express purpose of causing the term of the patent monopoly to coincide with the period when his commercial profit would be greatest. In holding the patent unenforceable, the Court stated:

> The purpose of the Constitution clause concerning patents is to promote the progress of science and the useful arts, and the plan adopted by Congress in exercise of the power has been to give one who makes a useful discovery or invention a monopoly in the making, use, and vending of it for a limited number of years. It is the legislative intention that the term shall run from the date of issue of the patent and that at the end of that time, the public might derive, from the full specifications required in the application accompanying the patent knowledge sufficient to enable it freely to make and use the invention. *Any practice by applicant for a patent through which he deliberately and without excuse postpones beyond the date of his actual invention the beginning of the term of his monopoly, and thus puts off the free public enjoyment of a useful invention, is an evasion of the statute and defeats its benevolent aim.*

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In *Webster*, the Supreme Court applied laches to a case where the claims were presented by amendment to a divisional application filed more than eight years after the filing of the original application. The Court found that the evidence established that the applicant "did not originally intend to assert these amended claims", and that throughout the intervening eight years, during which time the subject-matter of the asserted claims had been disclosed and had entered into general use, the applicant "simply stood by and awaited developments." *Webster*, 264 U.S. at 465, 44 S. Ct. at 343. On these facts, the Court had "no hesitation in saying that the delay was unreasonable, and, under the circumstances shown by the record, constitutes laches, by which petitioner lost whatever rights it might otherwise have been entitled to." *Webster*, 264 U.S. at 466, 44 S. Ct. at 343. Further explaining its reasoning, the Court stated:

> We do not overlook the importance of not applying so narrowly the patent law as to discourage the inventor from exercising his creative genius, or the manufacturer or capitalist from assisting in the necessary work of bringing the invention into beneficial use; *but it is no less important that the law shall not be so loosely construed and enforced as to subvert its limitations, and bring about an undue extension of the patent monopoly against private and public rights.*

Id. (emphasis added). *See also Wirebounds*, (65 F.2d at 906) ("if the inventor, intentionally or by reason of culpable neglect, be guilty of action which unduly postpones the time when the public would be entitled to the free use of the invention, and thus defeats the policy of the patent law, the right to a patent will be lost.").

In addition to allowing free use after the passage of a reasonable period of time, another fundamental and long recognized policy of patent law is to prevent an alleged inventor from recapturing exclusive rights after his invention has been disclosed and entered into general use. *See, e.g. Shaw v. Cooper*, 32 U.S. (7 Pet.) 292 (1833). *Shaw* involved a patent on an improvement for firearms which had been wrongfully disclosed by a relative of the inventor and which consequently had fallen into general public use in Europe before the patent was obtained in the United States. In

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Id. (emphasis added). *See also Wirebounds*, (65 F.2d at 906) ("if the inventor, intentionally or by reason of culpable neglect, be guilty of action which unduly postpones the time when the public would be entitled to the free use of the invention, and thus defeats the policy of the patent law, the right to a patent will be lost.").

In addition to allowing free use after the passage of a reasonable period of time, another fundamental and long recognized policy of patent law is to prevent an alleged inventor from recapturing exclusive rights after his invention has been disclosed and entered into general use. *See, e.g. Shaw v. Cooper*, 32 U.S. (7 Pet.) 292 (1833). *Shaw* involved a patent on an improvement for firearms which had been wrongfully disclosed by a relative of the inventor and which consequently had fallen into general public use in Europe before the patent was obtained in the United States. In

holding that the disclosure, even though unauthorized by the inventor, invalidated the patent, the Court emphasized the prejudice to the public of permitting the inventor to recapture an exclusive right

to inventions after they have become publicly available and lawfully adopted by others:

> No matter by what means an invention may be communicated to the public, before a patent is obtained, any acquiescence in the public use, by the inventor, will be an abandonment of his right. If the right were asserted by him who fraudulently obtained it, perhaps no lapse of time could give it validity; but the public stand in an entirely different relation to the inventor.
>
> The invention passes into the possession of innocent persons, who have no knowledge of the fraud, and at a considerable expense, perhaps, they appropriate it to their own use.

Shaw, 32 U.S. (7 Pet.) at 320. *See also Pfaff v. Wells Electronics, Inc.*, 525 U.S. 55, 64, 119 S. Ct. 304, 310 (1998) ("[R]eluctance to allow an inventor to remove existing knowledge from public use undergirds the on-sale bar."); *General Electric v. United States*, 654 F.2d 55, 61 (Ct. Cl. 1981) (describing the policy "against removing inventions from the public which the public has justifiably come to believe are freely available to all as a consequence of prolonged sales activity".).

The role of prosecution laches in protecting the rights of innocent parties who have adopted the technology at a time when it was freely available for public use was clearly recognized by the Supreme Court in *Crown Cork & Seal Co. v. Ferdinand Gutmann Co.*, 304 U.S. 159, 58 S. Ct. 842 (1938). In *Crown Cork*, the patentee had filed a divisional application containing new claims two years after his first patent issued, but before there was any adverse use of the newly claimed subject matter. The Supreme Court held that under those circumstances and in the absence of any evidence of any intent to abandon the claims, the defense of prosecution laches was unavailable. In so holding, however, the Court contrasted the facts of that case with *Webster*, in which the subject matter of the claims had been public for at least five years and were being commercially used by the defendant and others long before the claims at issue were filed. The Court noted that in *Webster* it had

> found that Kane [the inventor], deeming their subject-matter not invention, did not intend to assert [the new claims], and, prior to 1918, did not entertain an intention to have them covered by patent. During all of this time their subject matter was disclosed and in general use; Kane and his assignee simply stood by and awaited developments. It

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> was upon the reaso[illegible] stated that this court declared: 'We hav[illegible]hesitation saying that the delay was unreasonable, and, under circumstances shown by the record, constitutes laches by which the petitioner lost whatever rights it might otherwise have been entitled to.'

Crown Cork, 304 U.S. at 166, 58 S. Ct. at 845 (*quoting Webster*, 264 U.S. at 466, 44 S. Ct. at 343). (2)

2. Section 120 of the Patent Act Does Not Bar a Finding of Laches.

The district court below held that the enactment of the Patent Act denied it the ability to exercise its equitable powers. However, with few exceptions, not applicable here, it is well-recognized that the Patent Act was intended merely as a codification of the existing law and practice, and neither its language nor its legislative history supports the conclusion that Congress intended to overrule Supreme Court precedent and deprive the federal courts of their inherent equitable power to prevent abusive conduct which undermines the fundamental policies of the patent system.

The relationship between Section 120 and the prior law was specifically considered by this Court in *Transco Products, Inc. v. Performance Contracting, Inc.*, 38 F.3d 551, 556 (Fed. Cir. 1994). The issue in *Transco* was whether the inventor was required to disclose the "best mode" as it existed at the time of a continuation application under Section 120 or could rely instead upon the disclosure in his original application. In concluding that the inventor was not required to update his disclosure, this Court emphasized that Section 120 was not intended to change the law, but to codify prior continuation practice:

> Prior to 1952, continuing application practice was a creature of patent office practice and case law, and Section 120 merely codified the procedural rights of an applicant with respect to this practice. Before Section 120 was enacted, the Supreme Court noted that a continuing application and the application on which it is based are considered part of the same transaction constituting one continuous application. *The legislative history of Section 120 does not indicate any congressional intent to alter the Supreme Court's interpretation of continuing application practice. The Court of Customs and Patent Appeals (CCPA), a predecessor of this court, acknowledged that the state of law regarding continuing application practice had not been changed by the enactment of Section 120.*

Transco, 38 F.3d at 556-57 (emphasis added) (internal citations omitted). *See alsoIn re Bogese*, 1991 WL 340564, 22 U.S.P.Q. 2d 1821, 1827 (Com'r Pat. & Trademarks 1992) ("Section 120

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codified the existing law of continuation"); *In re Henriksen*, 399 F.2d 253 (C.C.P.A. 1968) (applying the pre-1952 case law permitting more than two continuation applications to post-1952 applications under Section 120). Implicit in this reasoning is a recognition that when Congress codified pre-1952 continuation practice it intended to adopt - not nullify - the extensive existing body of case law concerning continuation practice, including the equitable defense of prosecution laches.

This conclusion is also supported by *Studiengesellschaft Kohle mbH v. Northern Petrochemical Co.*, 784 F.2d 351 (Fed. Cir. 1986), in which this Court affirmed a finding that prosecution laches was not supported by the record, but did not question that the district court had the equitable power to apply the doctrine in an appropriate case; and by *Stark v. Advanced Magnetics, Inc.*, 29 F.3d 1570 (Fed. Cir. 1994), in which this Court held that, despite the lack of an express time limit in Section 256 of the Patent Act, laches may bar an application under that section to change the named inventor.

Although it is true that Section 120 of the Patent Act makes no reference to laches (or, indeed, any other defenses), Section 282 of the Patent Act clearly and expressly preserves the defense of "unenforceability", and makes it clear that that defense extends beyond the statutory defenses such as failure to meet the requirements of patentability under Part II of the Act and "any other fact or act made a defense to this title." *See* 35 U.S.C. 282 (1), (4). In *J.P. Stevens & Co. v. Lex Tex, Ltd.*, 747 F.2d 1553, 1561 (1984), this Court specifically construed this quoted language as preserving "equitable defenses such as laches, estoppel and unclean hands" (*quoting* P.J. Federico, "Commentary On The New Act", 35 U.S.C.A. at 55), and proceeded to adopt and apply the pre-1952 Supreme Court precedent to a claim of fraud in the procurement of a patent even though no such defense is recognized in the statute. *See also Kingsdown Medical Consultants, Ltd. v. Hollister Inc.*, 863 F.2d 867, 877 (Fed. Cir. 1988, *en banc*) (reaffirming the rule that "[w]hen a court has finally determined that inequitable conduct occurred in relation to one or more claims during prosecution of the patent application, the entire patent is rendered unenforceable.") There is nothing in the statute which would justify a finding that the equitable bar to enforcement

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based on unreasonable and prejudicial delay was intended to be treated differently from other equitable defenses which have been preserved under Section 282(1).

To the contrary, the legislative history of the Patent Act supports the notion that Section 120 was not intended to confer significantly greater rights on the patentee than were available under prior law. Thus, the joint House and Senate report states:

> Sections 120 and 121 express in the statute certain matters which exist in the law today but which had not before been written into the statute, and in so doing make some minor changes in the concepts involved.

S.Rep.No.1979, 82nd Cong., 2d. Sess. 6 (1952); H.R.Rep.No.1923, 82nd Cong., 2d Sess. 7 (1952). And, the Revision Notes state:

> Section 120 - New Section. This section represents present law not expressed in the statute, except for the added requirement that the first application must be specifically mentioned in the second.

This language precludes any inference that Congress intended to legislatively overrule the established Supreme Court precedent which places an equitable limitation on those who, without any justification or excuse, abuse the continuation process to fashion new claims to recapture rights against parties who are using technologies which had been publicly disclosed and were in general use and freely available at the time they were adopted.(3)

3. The Prior Decisions of This Court Are Consistent With Preserving the Defense.

As the foregoing discussion demonstrates, this Court has consistently recognized the continuing availability of non-statutory equitable defenses despite the adoption of the Patent Act. Nevertheless, the decision in the *Ford Motor Company* case, upon which the district court relied, asserts that "Federal Circuit and its predecessor have been reluctant to judicially limit the operation of Section 120." *Ford Motor Co.*, 42 U.S.P.Q. 2d at 1708. *Ford Motor* based its reasoning on *In re Hogan*, 559 F.2d 595 (C.C.P.A. 1977); *In re Henriksen*, 399 F.2d 253 (C.C.P.A. 1968); *Studiengesellschaft Kohle mbH v. Northern Petrochemical*, 784 F.2d 351; and *Advanced Cardiovascular Systems, Inc. v. Medtronic, Inc.*, 1996 WL 467273, 41 U.S.P.Q. 2d 1770

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(N.D. Cal. 1996). However, a careful reading shows that none of these cases support the conclusion drawn in *Ford Motor*.

Hogan merely held that a chain of continuing applications was not automatically barred, by virtue of the delay alone, from obtaining the benefit of the filing date of the earliest application. *Hogan* based its decision, in part, on the Supreme Court's decision in *United States v. American Bell Telephone Co.*, 167 U.S. 224 (1897), that the statute imposes no express time limit on continuations. However, neither the patent holder in *Hogan* nor the patent holder in *American Bell* was guilty of any inequitable conduct. The importance of this fact was underscored by the Supreme Court in *American Bell*:

> The mere fact of delay does not, therefore, operate to deprive the inventor of his legal rights. *Before he can be punished it must be shown that he has been guilty of a wrong, -- that he has caused the delay.* It matters not whether the delay be reasonable or unreasonable, for a brief time or for many years, *if the applicant is not responsible for it.* Whatever may be the injury to the public, if the delay is caused solely through the negligence or inattention of the tribunal before which the application is pending it is something for which the applicant is not responsible, and which does not affect his legal rights. [As is the case with litigation, a party] cannot be punished on account of the delay of the tribunal before which he is presenting his suit.

American Bell, 167 U.S. at 246 (emphasis added). The clear implication of this language is that the excessive delay would have barred enforcement if it were shown that the applicant "has been guilty of a wrong, - that he caused the delay."

Similarly, *Henriksen* (which, itself, relied on *Hogan*) simply held that Section 120 does not automatically limit an applicant to the filing date of the last preceding application, nor fix an arbitrary limit to the number of continuation applications which may be filed. However, far from supporting the reasoning of *Ford Motor*, the court relied on the prior case law to reach a result that was inconsistent with literal language of the statute, which provided that the applicant would only get the benefit of the filing date of the "previous application." Most significantly, there was no claim in *Henriksen* that the patentee had unreasonably and unjustifiably delayed the prosecution of his patent, or that the alleged infringer had been an innocent, adverse user, as required under *Crown Cork*.

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As previously noted, *Studiengesellschaft Kohle mbH v. Northern Petrochemical*, if anything, supports the view that the defense of laches is available. It does not hold that the defense was barred as a matter of law, but rather concludes, like *American Bell*, that the factual basis for the defense was unavailable because the delay was not the fault of the patent holder:

> The delay in patent issuance that we here confront here is appallingly long. The culprit, however, was not SKG but the tortuous interference practice.

Studiengesellschaft Kohle mbH v. Northern Petrochemical, 784 F.2d at 357. It was for this reason that the district court rejected defendant's argument of prosecution laches and this Court affirmed that finding. *SeeStudiengesellschaft Kohle mbH v. Northern Petrochemical*, 784 F.2d at 356-57.

Advanced Cardiovascular Systems, 1996 WL 467273, 41 U.S.P.Q. 2d 1770, is a district court decision that cites *A.C. Aukerman Co. v. R.L.Chaides Construction Co.*, 960 F.2d 1020 (Fed. Cir. 1992), for the proposition that this Court either has not recognized, or indeed has rejected, the doctrine of prosecution laches. However, *Aukerman* merely stands for the proposition that, for purposes of laches in bringing an infringement action, the delay must be measured from the date that plaintiff knew or should have known of the alleged infringement. To the extent it has any bearing on the defense of laches in prosecuting the patent claims, *Aukerman* supports the general proposition that the defense of laches is available in patent cases on claims which are not barred by a statutory time limit.(4)

In sum, the defense of prosecution laches is founded on sound equitable principles. It is supported by clear Supreme Court precedent and promotes the fundamental policies of the patent law by preventing patentees from unjustifiably extending their exclusive rights by delaying the commencement of the term until after their inventions have disclosed to the public and have fallen into general use. The express language of the Patent Act, its legislative history and numerous decisions of this Court all support the proposition that the Patent Act was intended to codify prior continuation practice and preserve established equitable defenses such as laches and estoppel. There

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is no reason or basis to exclude from the prior continuation practice codified by the Patent Act the defense of laches as established by the Supreme Court in *Woodbridge* and *Webster* and limited by *Crown Cork*. Accordingly, this Court should hold that the courts have the equitable power to deny enforcement of a patent where the patent holder has unjustifiably delayed the filing of its claims to the detriment of innocent parties who were lawfully practicing the invention after it was disclosed to the public and in general use.

CONCLUSION

For all of the foregoing reasons, the order appealed from should be reversed.

Dated: December 18, 2000

Respectfully submitted,

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Attorneys for Amicus Curiae
Intellectual Property Owners Association

Of Counsel:

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CERTIFICATE OF COMPLIANCE

Fed. R. App. P. 32 (a)(7)

I hereby certify pursuant to *Fed. R. App. P.* 32(a)(7)(C) that the attached brief complies with the type and volume limitations of *Fed. R. App. P.* 32(a)(7)(B) because the brief (excluding the Table of Contents, Table of Authorities, Statement of Related Cases, Jurisdictional Statement, and Statement of the Issue) contains 5088 words, as calculated automatically by my word processing system.

GEORGE L. GRAFF

Dated: December 18, 2000
New York, New York

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APPENDIX

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Scott M. Frank BellSouth Corp.	Kenneth Olsen Sun Microsystems, Inc.
Gary L. Griswold 3M Co.	James P. O'Shaughnessy Rockwell International Corp.
Harry J. Gwinnell Eastman Chemical Co.	Richard F. Phillips Exxon Mobil Corp.

J. Jeffrey Hawley Eastman Kodak Co.	Marcia D. Pintz FMC Corp.
Robert P. Hayter United Technologies Corp.	Vernon R. Rice E.I. DuPont de Nemours & Co.
Edward P. Heller, III Seagate Technology, Inc.	Peter C. Richardson Pfizer, Inc.
William B. Heming Caterpillar Inc.	Allen W. Richmond Phillips Petroleum Co.
Leslie C. Hodges Visteon Global Technologies, Inc.	Katie E. Sako Microsoft
Dennis H. Hoerner, Jr. Monsanto Co.	Robert R. Schroeder Mars Incorporated
Wayne C. Jaeschke Henkel Corp.	Carl L. Silverman Intel Corp.
George W. Johnston Hoffman-LaRoche Inc.	Brian W. Stegman BASF Corp.
Mark P. Kesslen Chase Manhattan Bank	Graham E. Taylor Dow Chemical Co.
Charles M. Kinzig SmithKline Beecham Corp.	Dean F. Vance Shell Oil Co.
Michael K. Kirschner Immunex Corp.	John K. Williamson PPG Industries, Inc.
Edward L. Levine Alcoa, Inc.	

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1. No member of the Board of Directors affiliated with any entity that is a party to any pending litigation with the Lemelson Medical, Education & Research Foundation, Limited Partnership voted on whether to file this brief or participated in the preparation or submission of this brief.

2. As this language indicates, the Court in *Crown Cork* was referring to the prejudicial impact of the delay on the alleged infringer in its discussion of *Webster*, not a rival patentee. There is nothing in that decision which supports the conclusion of the district judge in *Ford* (42 U.S.P.Q.2d at 1709-10) that the Court was limiting the doctrine of laches to cases where the new claims were only intended to provoke an interference. Rather, it is clear from the Court's decision in *Crown Cork* that the doctrine of prosecution laches remains available to parties who have been adversely affected by the patent holder's unjustified delay in filing claims until after his invention has fallen into general use.

3. The only case that suggests that Section 120 did something other than codify common law continuation practice is *In Re Bauman*, 683 F.2d 405 (C.C.P.A. 1982). There the Court stated:

The legislative history, however, makes it clear that mere codification, without modification, was not intended. "Sections 120 and 121 express in the statute certain matters which exist in the law today, but which had not before been written into the statute, and in so doing make some minor changes in the concepts involved." S.Rep.No. 1979, 82nd Cong., 2d Sess. 6 (1952); H.R.Rep.No. 1923, 82nd Cong., 2d Sess. 7 (1952). In the event of a point not addressed by the case law or an inconsistency between the case law and the statute, the statute, of course, prevails.

Bauman, 683 F.2d at 408 n.7. However, *Bauman* involved an issue which was unresolved in the prior law; and there is nothing in that decision, or the language it quotes, which would support the conclusion that the "minor changes" effected by the statute included overruling the Supreme Court's decisions in *Woodbridge* and *Webster* and their progeny.

4. We do not address the reasoning of this Court's decision in *Bott v. Four Star Corp.*, 848 F.2d 1245 (Fed. Cir. 1988) pursuant to Rule 47.6(b).

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DOES SUPREME COURT PRECEDENT SINK SUBMARINE PATENTS?

By Timothy R. DeWitt [FNa1]

I. Introduction

*601 Time and time again, clients seek assistance in defending patent infringement lawsuits brought by the owners of "submarine" patents. These patents often spend a decade or more as pending applications in the Patent and Trademark Office only to surface as issued patents at the height of commercial viability, wreaking havoc on well established industries. These submarine patents often leave entire industries scrambling for a defense because the long pendency of the applications permits the applicants to write claims that directly cover industry-standard products.

Perhaps it is time to fight fire with fire - to sink the submarine patents with "submarine" Supreme Court decisions. More than a hundred years ago the Supreme Court began a line of decisions that condemned the practice of enlarging the scope of patents many years after their issuance. [FN1] Although the condemnation originated in the context of broadening reissues, it spread to continuation and divisional practice by way of analogy. [FN2] Over time a number of factors, ranging from incomplete codification to "modification by treatise," [FN3] have served to obscure these still-valid decisions to the point that accused infringers neglect to raise and vigorously argue them in the district courts.

Recently however, with the seemingly ever-increasing number of submarine patents, these long-overlooked Supreme Court decisions have been thrust back into the public eye. The most notorious recent *602 development, of course, is the highly publicized "flip-flop" of the Nevada district court in Ford Motor Company v. Lemelson. [FN4]

The heightened interest in the Supreme Court decisions, and Webster Electric Co. v. Splitdorf Electric Co. in particular, [FN5] began in June of 1995 when a Nevada magistrate judge issued a Report and Recommendation which found Jerome Lemelson's [FN6] patents unenforceable on summary judgment due to Lemelson's delay in prosecuting those patents. [FN7] In April, 1996, the district court judge adopted the magistrate's Report and Recommendation. [FN8] The Report and Recommendation, published together with the district judge's two paragraph adoption of the Report and Recommendation, presented a detailed analysis of both the reissue statute and the doctrine of laches. [FN9]

With respect to reissue, Ford Motor had argued that the two-year limitation on filing broadening reissues should apply as an absolute bar to continuation and divisional application practice. [FN10] The magistrate noted that no relationship, express or implied, existed in the statutory scheme between the reissue section, 35 U.S.C. § 251, and the continuing application section, 35 U.S.C. § 120. [FN11] Accordingly, the magistrate found that the statutes themselves did not mandate the application of the two-year limitation on broadening reissues to continuing application practice. [FN12]

The magistrate also considered the public policy implications of Ford Motor's argument and found that public policy weighed against applying the two- year limit to continuing applications. [FN13] In particular, the magistrate found that:

The legal conclusion urged by Ford would encourage inventors to hide their disclosures by not taking patents. Instead, they would choose to abandon *603 pending applications to avoid the imposition of § 251's two year reissue limitation in favor of continuation practice which would remain otherwise unlimited by statute. Such a result would ratify the "submarine" practice Ford seeks to defeat. [FN14]

Accordingly, the court refused to construe the reissue statute as necessarily limiting the use of continuing applications. [FN15]

The magistrate proceeded to analyze Lemelson's prosecution activities under the doctrine of laches. [FN16] The magistrate began the analyses with the broad foundation of laches generally: "equity aids the vigilant, not those who slumber on their rights." [FN17] Laches, of course, does not require reliance or intent as do other equitable defenses such as estoppel or fraudulent delay. [FN18] Rather, the

doctrine is applied where there is no statutory period of limitation on a party's right to enforce his interest. [FN19]

Preliminarily, the magistrate noted the distinction between laches and equitable remedies generally:

Although the majority of case law on laches involves parties' delays in bringing suits to enforce rights, courts have extended equitable rules to parties' activities in the patent application process. [FN20]

The magistrate then cited inequitable conduct [FN21] and file wrapper estoppel [FN22] as two examples of equity reaching into the prosecution of patents. [FN23]

This distinction between the patent defense commonly known today as "laches" and equitable remedies generally has become particularly important in view of a later decision issuing from the District Court *604 for the Northern District of California which attempted to mechanically apply Federal Circuit law on laches to the prosecution of a patent. [FN24] The result of that court's mechanical analysis was the striking of the defendants' laches defense. [FN25]

In particular, the court in Advanced Cardiovascular Systems, Inc. v. Medtronic, Inc. applied the laches analysis set forth by the Federal Circuit in its landmark decision in A.C. Auckerman Co. v. R.L. Chaides Construction Co. [FN26] The Auckerman decision held that the laches delay period begins when the patentee has notice that it has a cause of action against the defendant for infringement. [FN27] If the laches elements are satisfied, the patentee is barred from collecting damages prior to filing suit. [FN28] As the Medtronic court found, this laches defense defined in Auckerman is wholly inappropriate for delays in prosecuting the patent. [FN29] The patentee cannot have knowledge of its cause of action prior to issuance of the patent because no cause of action exists until the patent issues. The Medtronic court's analysis, however, fails to consider equitable remedies generally.

Contrary to the court in Medtronic, the magistrate in Ford Motor analyzed the defense in terms of Supreme Court precedent on the general application of equity in patent cases rather than mechanically analyzing the defense under the laches principles set forth by the Federal Circuit in Auckerman. [FN30] This general application of equity to prosecution delays may be referred to as "inequitable delay."

The Ford Motor magistrate's general equity analysis began with a discussion of the Federal Circuit's decision in Studiengesellschaft Kohle mbH v. Northern Petrochemical Co. [FN31] In that case, the Federal Circuit affirmed a district court's finding of no laches in an infringement suit based on a patent which issued more than twenty years after the application was filed. [FN32] The Federal Circuit's decision addressed two issues relevant to prosecution delays. First, the Federal Circuit considered whether the patentee bore responsibility for the delay and found that the *605 delay was due to the Patent Office and not the applicant. [FN33] Second, the Federal Circuit considered whether it should set an arbitrary limit on the acceptable length of prosecution regardless of who bears responsibility for the delay. The Federal Circuit declined to set an arbitrary limit:

The delay in patent issuance that we here confront is appallingly long. The culprit, however, was not SGK but the tortuous interference practice. We are without authority to set our own arbitrary limit. [FN34]

The critical aspect of the Federal Circuit's decision is that it did not state that laches cannot apply to delays in prosecuting a patent.

The magistrate next considered the Supreme Court's decisions in Crown Cork & Seal Co. v. Ferdinand Gutmann Co., Inc. [FN35] and in Webster Electric. Co. v. Splitdorf Co. [FN36] The Webster Electric decision found laches due to an applicant's lengthy delay in prosecuting the patent application. [FN37] The later Crown Cork decision clarified Webster Electric by explicitly stating that no fixed two-year presumption of laches exists for continuation applications. [FN38]

The magistrate in Ford Motor Co. then analyzed Lemelson's conduct to determine whether it was reasonable. The magistrate found the conduct to be unreasonable because Lemelson did not present the subject claims to the patent office until decades after he first filed his application; and on that basis, the magistrate found Lemelson's patents to be unenforceable. [FN39] The district judge later adopted the magistrate's Report and Recommendation. [FN40]

Nearly a year after it first adopted the magistrate's Report and Recommendation finding Lemelson's patents invalid and unenforceable, the Nevada district court reversed its decision on reconsideration.

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[FN41] The Nevada district court based its reversal on a perceived judicial "reluctance to equitably restrict patent continuation practice" [FN42] and a misreading of Supreme Court precedent. The court itself acknowledged that the cases upon which it relied did not squarely address the issue of equity in the *606 context of the prosecution of a patent. The court characterized its reliance as follows:

While it is true that these cases do not squarely address the applicability of the equitable doctrine of laches in the context of 35 U.S.C. § 120, the tenor of these cases expresses an unwillingness to judicially circumscribe the delays inherent in the operation of statutory schemes. [FN43]

The court's analysis in this regard was wholly off the mark. The equity issue relating to submarine patents is not simply the amount of time the patent spent in prosecution, but rather whether the patentee abused the statutory scheme with an unreasonable delay that operated to the detriment to others. None of the cases relied upon by the Nevada court addressed the equitable aspect of the issue. Instead, all those cases dealt with attempts to create mechanical judicial limitations of statutory schemes. [FN44] Such a practice would obviously be improper.

The decisions in Ford Motor Co. and Medtronic actually highlight a critical point of the early Supreme Court decisions addressing inequitable delay. In particular, a mechanical limitation on the use of continuation practice will be inherently unfair to owners of patents whose issuance was delayed through no fault of their own. A governmental agency such as the Patent Office inherently suffers bureaucratic delays which should not serve to prejudice patentees. Instead, the statutory scheme should assume honesty and good faith on the part of applicants and permit, as it does, unlimited continuation application practice. Courts of equity, on the other hand, should preclude abuse of the system.

II. Submarine Patents and Double Patenting

The patent laws provide applicants with several procedural vehicles for prosecuting their patent claims, several of which may be used to delay issuance of a patent. Those vehicles include continuation, continuation-in-part, divisional, and reissue applications. [FN45] A continuation application is one that claims the benefit of the filing date of an earlier application. An application whose subject matter is disclosed in accordance with 35 U.S.C. § 112 in an earlier filed U.S. application may claim the benefit of the filing date of that earlier application if it was filed before the patenting or abandonment or termination of proceedings *607 on the first application or on an application similarly entitled to the benefit of the filing date of the first application. [FN46]

A continuation-in-part application likewise may claim the benefit of the filing date of an earlier application to the extent the claims of the later application are supported by the disclosure of the earlier application. [FN47] A divisional application permits an applicant to file a second patent application having the same disclosure as an earlier filed application, and to obtain the benefit of the filing date of the earlier application when two or more distinct inventions are disclosed and supported by the disclosure. [FN48] In each of these practices, the earlier application typically will either issue into a patent or go abandoned shortly after the filing of the continuation, continuation-in-part, or divisional application.

These practices often result in a series of patents issuing from a single disclosure. At least one well-established limitation, double patenting, does exist. The basic concept of double patenting is that the same invention cannot be patented more than once, since that would result in a second patent which would expire after the term of the first patent and extend the time of the protection. [FN49] Only the claims are compared when assessing double patenting. [FN50] Two types of double patenting exist: same invention and obviousness-type. [FN51]

Same invention double patenting arises under 35 U.S.C. § 101, which permits "a" patent for any new and useful process, machine, manufacture or composition, or any new and useful improvement therof. [FN52] For same invention-type double patenting to exist, the two patents must be drawn to identical subject matter. [FN53] The test is whether *608 the claims of the two patents cover the same subject matter. [FN54] However, the fact that claims of one patent dominate the claims of another does not necessarily mean that the patents claim the same invention. [FN55]

Obviousness-type double patenting is a judicially created doctrine grounded in public policy. [FN56] The doctrine prohibits the issuance of claims in a second patent which are not patentably distinct from those in a first patent. [FN57] The question involved in obviousness-type double patenting is whether the

claimed invention in the second patent or application, in light of the prior art, constitutes a merely obvious variation of the invention defined in the claims of the first. [FN58]

A patentee can overcome an obviousness-type double patenting problem by submitting to the Patent Office a terminal disclaimer stating that the second patent will expire with the first. [FN59] A terminal disclaimer "is not an admission of obviousness of the later-filed claimed invention in light of the earlier-filed disclosure." [FN60] It raises neither a presumption nor estoppel as to the merits of an obviousness-type double patenting claim. [FN61]

Double patenting, however, does not prevent the issuance of submarine patents because it is too easy for applicants to avoid the double patenting rejection. In particular, an applicant could file a very general patent application with very few generic claims. As the industry develops, the applicant could then add new claims to pending continuation applications to cover the specific features which have now become valuable in the marketplace. Since those specific features did not appear in the few claims of the earlier patent, there can be no double patenting rejection. In this manner the applicant delays issuance of claims on each particular feature until the feature becomes commercially important.

*609 III. Equity Should Bar Recovery For Infringement Where the Patentee Unreasonably Delayed the Prosecution of the Patent and Intervening Adverse Rights Exist

Under the still-valid Supreme Court decision in Webster Electric, equity should bar recovery for patent infringement where the patentee unreasonably delayed the prosecution of the patent and adverse intervening rights exist. In Webster Electric, the Supreme Court analogized abuse of continuation practice to abuse of reissue practice and found that patent-in-suit to be unenforceable due to the patentee's unreasonable delay in prosecuting the patent. [FN62] The foundation for that analogy remains intact and the doctrine should be applied today to submarine patents.

A. The Foundation Of The Reissue Analogy

Reissue applications arose from Supreme Court precedent recognizing the need of patentees to correct mistakes which would unjustly deny them their rights under the patent laws. [FN63] The early cases encompassed only narrowing reissues. [FN64] Without explanation, however, the Supreme Court eventually permitted broadening reissues. [FN65]

The Patents Acts of 1832 and 1836 codified the power to reissue and specified the requirements for reissue as follows: (1) the original patent be "inoperative or invalid"; (2) the failure to comply with the patent laws be due to "inadvertence, accident or mistake, and without any fraudulent or deceptive intention"; and (3) the reissued patent be "for the same invention" as the original patent. [FN66] The Patent Act of 1870 added a prohibition on new matter. [FN67]

*610 In time, the Supreme Court began to permit broadening reissues. In Miller v. Brass, the Supreme Court described the initial purpose of reissues as follows:

It will be observed that [while] the law authorizes a reissue when the patentee has claimed too much, so as to enable him to contract his claim, it does not, in terms, authorize a reissue to enable him to expand his claim. The great object of the law of reissues seems to have been to enable a patentee to make the description of his invention more clear, and specific, so as to comply with the requirements of the law in that behalf, which were very comprehensive and exacting. [FN68]

Several years after the enactment of the reissue statute, Congress enacted the requirement that the applicant "particularly specify and point out the part, improvement, or combination which he claims as his own invention or discovery." [FN69] Although it had been customary prior to that time to append a claim to most specifications, it was the first statutory requirement to do so. [FN70] The Supreme Court analyzed the issue of broadening reissues under this framework as follows:

> Now, in view of the fact that a reissue was authorized for the correction of mistakes in the specification before a formal claim was required to be made, and of the further fact that when such formal claim was required express power was given to grant a reissue for the purpose of making a claim more narrow than it was in the original, without any mention of a reissue for the purpose of making a claim broader than it was in the original, it is natural to conclude that the reissue of a patent for the latter purpose was not in the mind of Congress when it passed the laws in question. It was probably supposed that the patentee would never err in claiming too little. Those who have any experience in business at the Patent

> Office know the fact, that the constant struggle between the office and applicants for patents has reference to the claim. The patentee seeks the broadest claim he can get. The office, in behalf of the public, is obliged to resist this constant pressure. At all events, we think it clear that it was not the special purpose of the legislation on this subject to authorize the surrender of patents for the purpose of reissuing them with broader and more comprehensive claims, although, under the general terms of the law, such a reissue may be made where it clearly appears that an actual mistake has inadvertently been made. [FN71]

Thus, it came to be that applicants could broaden their patent claims through reissue.

Initially, no time limit existed for an applicant to file a broadening reissue. The statutes did not specifically mention broadening reissues and did not specifically mention any time limit on filing them. [FN72] *611 Eventually, the Supreme Court recognized that applicants were abusing the process:

But by a curious misapplication of the law it has come to be principally resorted to for the purpose of enlarging and expanding patent claims. And the evils which have grown from the practice have assumed large proportions. Patents have been so expanded and idealized, years after their first issue, that hundreds and thousands of mechanics and manufacturers, who had just reason to suppose that the field of action was open, have been obliged to discontinue their employments, or to pay an enormous tax for continuing them. [FN73]

In response to the abuse and despite the absence of any such restriction in the statutory scheme, the Supreme Court began placing limitations on reissues.

The first restriction on broadening reissues was that of diligence. Stated concisely, the Supreme Court held:

The granting of a reissue for such a purpose, after an unreasonable delay, is clearly an abuse of the power to grant reissues, and may justly be declared illegal and void. [FN74]

Thus, the courts, not Congress, imposed a diligence requirement on the filing of broadening reissues.

The two-year limitation on broadening reissues arose via the Supreme Court's analogy to the law of public use:

[W]hile no invariable rule can be laid down as to what is reasonable time within which the patentee should seek for the correction of a claim which he considers too narrow, a delay of two years, by analogy to the law of public use before an application for a patent, should be construed equally favorable to the public, and that excuse for any longer delay than that should be manifest by the special circumstances of the case. [FN75]

Later, Congress codified the two-year limitation. [FN76]

Today, reissue applications permit an applicant to correct errors made in a previously issued patent: a reissue application which seeks to enlarge the scope of an issued patent must be filed within two years after the patent issues while a reissue application which does not seek to broaden the coverage of a patent may be filed at any time. [FN77] This two year limitation in "[t]he reissue statute balances the purpose of providing the patentee with an opportunity to correct errors of inadequate claim scope, with the public interest in finality and certainty of patent rights." [FN78]

*612 The provisions of the patent statutes generally relating to applications apply to applications for reissue patents, and there may be more than one reissue patent for distinct and separate parts of the thing patented. [FN79] Thus, continuation, continuation-in-part, and divisional applications may be filed claiming priority to a reissue application. [FN80] The Federal Circuit described the specific effect of paragraphs 2 and 3 of the reissue statute as follows:

Section 251[2] has the effect of assuring that a different burden is not placed on divisional or continuation reissue applications, compared with divisions and continuations of original applications, by codifying the Supreme Court decision which recognized that more than one patent can result from a reissue proceeding. Thus § 251[2] places no greater burden on [the patentee's] continuation reissue application than upon a continuation of an original application.. [FN81]

Thus, the Federal Circuit has clearly stated that the law that applies to traditional continuation applications equally applies to reissue continuation applications.

The two-year limitation on asserting claims broader than those in the original patent remains in effect with respect to divisional or continuation reissue applications. [FN82] In other words, an applicant may not submit broadened claims for the first time more than two years after the issuance of the original patent. [FN83] In Graff, the Federal Circuit considered this exact issue and reached the following conclusion:

On this case, the public had no notice that broadening was being sought until after the two-year period. We discern no justification for imposing this degree of uncertainty upon the public. [FN84]

The two-year limitation on the filing of broadened claims arises from the notice function of patent claims established by the requirements of 35 U.S.C. § 112. In particular, the primary purpose of the requirement in the patent laws that patent claims distinctly claim the subject matter the applicant considers to be his invention is "to guard against unreasonable advantages to the patentee and disadvantages to others arising from uncertainty as to their rights." [FN85] In other words, patent claims serve the ***613** notice function of advising the public as to what is protected and what remains open to the public. [FN86]

B. The Notice Function And The Two Year Limitation On Broadening Patent Claims

Consistent with the notice function of the claims, the law is well-settled that "subject matter disclosed but not claimed in a patent application is dedicated to the public." [FN87] This principle dates back as far as the Supreme Court decision in Miller v. Brass Co. [FN88] and has been consistently reiterated and upheld by the Supreme Court for more than a hundred years. [FN89]

In Miller, the Supreme Court vigorously attacked a patentee's practice of enlarging the scope of a patent's claim many years after its issuance. [FN90] The Court recognized that if a patentee believes he is entitled to broader claims than those issued in the original patent, and uses due diligence in returning to the Patent Office, his application may be entertained and, upon a proper showing, broader claims may be issued. [FN91] "But it must be remembered that the claim of a specific device or combination, and an omission to claim other devices or combinations apparent on the face of the patent, are, in law, a dedication to the public ***614** of that which is not claimed." [FN92] To protect the public while at the same time permitting a patentee with due diligence to prosecute broader claims than in the original patent, the Court held that:

> Any unnecessary laches or delay in a matter thus apparent on the record affects the right to alter or reissue the patent for such cause. [FN93]

Thus, if a patentee desires to prosecute broader claims than those in the original patent, the patentee must do so with due diligence or lose any rights it may have to those broader claims.

These principles underlie the two-year time limit set forth in the reissue statute. "The purpose of the law that a broadening reissue must be applied for within two years after patent grant is to set a limited time after which the public may rely on the scope of the claims of an issued patent." [FN94] In other words, "no one should be relieved who has slept upon his rights, and has thus led the public to rely on the implied disclaimer involved in the terms of the original patent." [FN95]

The essence of the notice function is that, at some point in time, the public should be entitled to know the exact scope of the patent protection. Permitting a patentee to continuously alter or enlarge the scope of the patent protection completely frustrates this function.

C. Analogizing Continuation Practice to Reissue Practice

The Supreme Court has applied this principle, by analogy, to invalidate divisional and continuation applications. [FN96] The analogy has a sound logical foundation because the use of continuation and divisional applications to indefinitely delay the filing of broadening claims circumvents the purpose and spirit of the statutes. [FN97] In particular, if ***615** continuation and divisional applications may be used to submit broadened claims for an indefinite period of time after the issuance of the first patent, there can be no finality or certainty of patent rights. [FN98] Thus, the public interest in finality and certainty is completely frustrated.

The Supreme Court set fo[illegible]he foundation for the analogy in its st[illegible]lid decisions in Miller and Webster Electric.

1. The Miller v. Brass Co. Decision

In Miller v. Brass Co., the Supreme Court considered the validity of a broadening reissue patent filed fifteen years after the issuance of the original patent. [FN99] The Court found diligence, or the lack thereof, to be the key issue:

If a patentee who has no corrections to suggest in his specification except to make his claim broader and more comprehensive, uses due diligence in returning to the Patent Office, and says "I omitted this," or "my solicitor did not understand that," his application may be entertained, and, ona proper showing, correction may be made. But it must be remembered that the claim of a specific device or combination, and an omission to claim other devices or combinations apparent on the face of the patent, are, in law, a dedication to the public of that which is not claimed. It is a declaration that that which is not claimed is either not the patentee's invention, or, if his, he dedicates it to the public. This legal effect of the patent cannot be revoked unless the patentee surrenders it and proves that the specification was framed by real inadvertence, accident, or mistake, without any fraudulent or deceptive intention on his part; and this should be done with all due diligence and speed. Any unnecessary laches or delay in a matter thus apparent on the record affects the right to alter or reissue the patent for such cause. [FN100]

The Court continued on to consider the practice of altering a patent after others in the industry have produced new forms of improvement:

It will not do for the patentee to wait until other inventors have produced new forms of improvement, and then, with the new light thus acquired, under pretence of inadvertence and mistake, apply for such an enlargement of his claim as to make it embrace these new forms. Such a process of expansion carried ***616** on indefinitely, without regard to lapse of time, would operate most unjustly against the public, and is totally unauthorized by the law. In such a case, even he who has rights, and sleeps upon them, justly loses them. [FN101]

Thus, the Supreme Court found that the practice of continuously altering the scope of a patent to cover developing commercial applications was wholly inappropriate when the patentee had unreasonably delayed in presenting its claims to the patent office.

The condemned practice in Miller should be distinguished from the practice of writing claims to cover competitors' products when no unreasonable delay has occurred. Such practice is entirely proper and has been upheld by the Federal Circuit. [FN102] Therefore, the key to the Miller decision is the unreasonableness of the applicant's delay in the prosecution, not the writing of claims to cover competitors' products.

2. The Webster Electric Decision

The facts in Webster Electric Co. v. Splitdorf Electric Co. evidenced a long history of continuation and divisional applications. [FN103] The patentee, Kane, filed his first patent application in 1910. [FN104] A patent covering the same subject matter issued to the Podlesaks in 1913, and a reissue patent was also granted in 1915. [FN105] Later in 1915, Kane filed a divisional application which copied the claims of the Podlesak patent, thereby invoking an interference which the Podlesaks eventually won. [FN106] In 1916, Kane was issued a patent on his first application. Thereafter, in June, 1918, Kane amended his divisional application to recite new claims which were allowed and issued into the patent-in-suit in September 1918. [FN107] The claims that issued in 1918 "were for the first time presented to the Patent Office, by an amendment to a divisional application eight years and four months after the filing of the original application, [and] five years after the date of the original Podlesak patent. . . ." [FN108]

***617** In a later case, the Supreme Court summarized its findings in Webster Electric as follows:

[W]e found that Kane, deeming their subject matter not invention, did not intend to assert them, and, prior to 1918, did not entertain an intention to have them covered by patent. During all of this time their subject matter was disclosed and in general use; Kane and his assignee simply stood by and awaited developments. It was upon the reasons so stated that this Court declared "We have no hesitation in saying that the delay was unreasonable, and, under the circumstances shown by the record, constitutes laches, by which the petitioner lost whatever rights it might otherwise have been entitled to." [FN109]

The Supreme Court [illegible] its ultimate conclusion in [illegible]ter Electric as follows:

> Our conclusion, therefore, is that in cases involving laches, equitable estoppel or intervening private or public rights, the two-year time limit prima facie applies to divisional applications and can only be avoided by proof of special circumstances justifying a longer delay. In other words, we follow in that respect the analogy furnished by the patent reissue cases. [FN110]

Therefore, the Webster Electric decision implies that the two-year limitation of reissues applies to divisional and continuation applications.

3. The Crown Cork & Seal Decision: Limiting Webster Electric to Cases of Intervening Adverse Rights

In Crown Cork & Seal Co. v. Ferdinand Gutman Co., the Supreme Court upheld Webster Electric, but limited its scope by distinguishing it from the stated facts. In particular, the Court in Crown Cork addressed the question:

Does this Court's decision in Webster Electric Co. v. Splitdorf Co. mean that, even in the absence of intervening adverse rights, an excuse must be shown for a lapse of more than two years in presenting claims in a divisional application regularly filed and prosecuted in accordance with patent office rules? [FN111]

The Court answered the question in the negative by finding that absent adverse intervening rights, the patentee need not show an excuse for a lapse of more than two years in presenting new claims in a divisional application. [FN112] The Crown Cork Court refused to shift the burden of proof *618 to the patentee merely because the delay exceeded two years. The Court did not overrule Webster Electric. However, in dicta, it limited Webster Electric to cases in which intervening adverse rights and some evidence of abandonment exists. The Supreme Court later implicitly recognized that adverse intervening rights can render divisional and continuation applications invalid. [FN113]

4. Interpreting Webster Electric After Crown Cork & Seal

The Webster Electric court used the terminology "intervening adverse rights" in the context of its analogy to the reissue cases. Thus, one must consult the reissue cases decided contemporaneous with and prior to Webster Electric to determine the proper meaning of that terminology. Upon doing so, it is abundantly clear that "adverse intervening rights" arise from public uses, manufactures or sales of products, and are not limited to interfering patents. [FN114] The inclusion of public uses and sales as giving rise to "intervening adverse rights" is further evident from the Court's decision in Muncie Gear Works v. Outboard, Marine & Mfg. Co. [FN115] The Court in Muncie characterized the difference between the date on which an invention is used in public by an unauthorized user as opposed to an authorized user as "critical." [FN116] Therefore, the rights must be "interfering," i.e., arising before the applicant presents the broadened claim to the patent office, and must be "adverse," i.e., without authorization of the patentee.

The foundation for the Supreme Court's decision in Webster Electric remains on solid ground. In particular, the Supreme Court based the decision in Webster Electric on an analogy to the law applying to reissue applications. That Supreme Court law applying to reissues has now been codified establishing a strict rule that broadened claims may not be filed in a reissue more than two years after the issuance of the original patent.

*619 IV. The Federal Circuit Has Implicitly Recognized The Webster Electric Defense

The Federal Circuit has acknowledged Webster Electric type defenses in dicta on two occasions, most recently in Stark v. Advanced Magnetics, Inc. [FN117] The court in Stark considered the issue of whether an inventor who is excluded from a patent must act diligently in seeking correction of inventorship. Although the issue in Stark is different than inequitable delay, the Federal Circuit's dicta relating to diligence generally is enlightening. [FN118] The Federal Circuit addressed lack of diligence generally as follows:

Lack of diligence may be an appropriate basis for barring legal action when there is an affirmative obligation on the claimant to act promptly and without significant pause in establishing a legal right. The common law has recognized that varying degrees of diligence may be required, depending on the circumstances. For example, a higher degree of diligence is appropriate when the claimant is

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chargeable with injury or di[illegible]antage to another due to the claimant's [illegible]re to act expeditiously . . . . [FN119]

The Federal Circuit concluded that there are circumstances where diligence is an appropriate requisite to pursuit of a particular legal right, whether or not the defense of laches or estoppel may be invoked against the claimant. [FN120]

Unquestionably, the Stark decision leaves the door open to general equitable defenses arising from lack of diligence or unreasonable delay. The Federal Circuit tied the significance of the lack of diligence to the injury a delay may cause to others. [FN121] With respect to the correction of inventorship, the court specifically noted that the statutes and regulations did not require diligence. [FN122] However, the court held that "[w]hether diligent action is required in a particular case must be determined on the facts of that case." [FN123] Thus, despite the absence of a statutory or regulatory time limitation, the Federal Circuit mandated case by case consideration of the diligence requirement. [FN124]

*620 Unreasonable delay in the prosecution of a patent likewise should be the subject of case by case consideration by the court. Where intervening adverse rights exist, as was the case in Webster, the case for an equitable remedy is strong. More specifically, the injury likely to occur to others due to an applicant's unreasonable delay is great. As noted by the Federal Circuit in Stark:

[T]he graver, more important, or valuable the interests involved, and the more imminent the peril, the more is the vigilance required to constitute diligence. [FN125]

The graveness of the injury to others when a submarine patent issues years after entire industries have adopted a particular technology cannot be understated. On the other hand, if no intervening adverse rights exist, the likely injury to others is minimal. Thus, one can see the importance of adverse intervening rights under the Federal Circuit's general test for equitable remedies based on lack of diligence.

The second Federal Circuit decision recognizing this type of defense is Studiengesellschaft Kohle mbH v. Northern Petrochemical Company. [FN126] In that case, the Federal Circuit addressed a defense that the patentee was guilty of laches or other inequitable delay in the prosecution of the patent-in-suit. The Federal Circuit did not state that no such claim exists. Instead, it evaluated the delay and found that responsibility for the delay rested with the PTO's interference procedures rather than any actions of the patentee. Accordingly, the Federal Circuit stated:

[W]e discern no error in the conclusion that SGK had not delayed inequitably and that the prolonged period of pendency was due to the PTO and not the applicants. [FN127]

Based on these two Federal Circuit decisions, the Federal Circuit may be receptive to a Webster Electric argument. It is worth noting that the Federal Circuit has never cited Crown Cork, but it has cited Webster Electric for the exact proposition set forth in this paper: "[N]o one should be relieved who has slept upon his rights, and has thus led the public to rely on the implied disclaimer involved in the terms of the original patent . . . ." [FN128]

*621 V. Ford Motor Company v. Lemelson: an Extraordinary Misreading of Webster Electric

The recent decision from the District Court for the District of Nevada in Ford Motor Company v. Lemelson, [FN129] does not diminish the significance or applicability of Webster Electric to unreasonable prosecution delays when adverse intervening rights exist. As a preliminary matter, the decision in Ford Motor Co. is simply wrong. The court in Ford Motor Co. based its decision on the assumption that Webster Electric is limited to interferences. [FN130] That assumption is clearly incorrect. Webster Electric was not a decision on an appeal from an interference decision. It was an appeal from a decision in a lawsuit for infringement of a patent. [FN131] As such, it cannot possibly be limited to interferences.

The Nevada court apparently was confused by the reference in Webster Electric and Crown Cork to "adverse intervening rights." That language cannot mean that there must be an interference because no interference existed in Webster Electric. Rather, it references the rights of another which arise after the filing of the first patent application, but before the broadened claims are added to the continuation or divisional application. The concept of intervening rights is well known in the reissue context, and in view of Webster Electric's explicit analogy to reissue, it is clear that the reference to "adverse intervening rights" is a reference to reissue-type intervening rights rather than a reference to an interference.

This interpretation of the meaning of adverse intervening rights is supported by the notice function of patents. In particular, the public has an undeniable interest in the finality and certainty of patent rights. [FN132] Once a patent issues, and after a reasonable amount of time, the public should be able to rely on the fact that "subject matter disclosed but not claimed in a patent application is dedicated to the public." [FN133] Where a sufficient amount of time has passed due to an applicant's unreasonable delay, the public should be permitted to practice unclaimed subject matter disclosed in an issued patent.

***622** The Nevada district court's confusion may in part have been caused by a well-renown treatise on patent law. [FN134] The treatise confuses the facts of Chapman v. Wintroath, [FN135] an early Supreme Court decision relating to interferences, with the facts of Webster Electric and concludes that Webster Electric has been codified in 35 U.S.C. § 135(b), which relates only to interferences.

The Chapman case considered the issue of whether an applicant for a patent may copy the claims of an issued patent twenty months after the issuance of the patent to provoke an interference in the patent office. The Supreme Court found that the applicant could copy the claims of the issued patent under the facts of the case, but it seemed to assume the validity of applying the two-year statutory period for filing claims conflicting with an issued patent.

In the Act of 1939, Congress dealt expressly with the interference problem considered in Chapman by providing that no application may be amended to add a claim "for the same or substantially the same subject matter" as a claim of an issued patent more than one year from the date the patent issued. [FN136] That statute does not apply as a defense in an infringement lawsuit. It is limited to interferences and, thus, cannot possibly codify the holding of Webster Electric, which did not involve an interference.

The treatise incorrectly groups Chapman and Webster Electric together as being codified by 35 U.S.C. § 135(b) and concludes that "[p]ossible implications of Webster Electric outside the interference context were dispelled by the Supreme Court in Crown Cork & Seal v. Ferdinand Gutmann Co." [FN137] That conclusion ignores the express language of the Crown Cork decision itself:

It is clear that, in the absence of intervening adverse rights, the decision in Webster Electric v. Splitdorf Co. does not mean that an excuse must be shown for a lapse of more than two years in presenting the divisional application. [FN138]

The Crown Cork decision unequivocally states "in the absence of adverse intervening rights." It does not limit Webster Electric to interferences.

In any event, the misconception in the treatise polluted the district court's analysis in Ford Motor Co. That mistaken confusion between "interferences" and "adverse intervening rights" should not be continued.

***623** VI. Conclusion

The Federal Circuit has acknowledged that general equitable remedies relating to lack of diligence exist in patent cases. In view of the Supreme Court's decision in Webster Electric and its own decisions in Stark and Studiengesellschaft, the Federal Circuit should recognize inequitable delay as an equitable defense when intervening adverse rights exist.

With respect to the two-year limitation on broadening reissues, that limitation clearly should not apply as a mechanical limitation of continuation and divisional applications. Courts have repeatedly rejected such mechanical time limitations. [FN139] Perhaps instead of serving as a time limitation on continuation and divisional applications, the two-years should serve as a limitation on the doctrine of inequitable delay, i.e., a prosecution delay less than two years cannot be unreasonable.

Regardless of the applicability of the two-year limitation on reissues, courts should consider and apply the defense of inequitable delay in appropriate cases.

FNa1. Of Counsel, Arnold & Porter in Washington, D.C.

FN1. Miller v. Brass Co., 104 U.S. 350 (1881).

FN2. Webster Elec. Co. v. Splitdorf Elec. Co., 264 U.S. 463 (1924).

FN3. See infra, footnote 134 and accompanying text.

FN4. 40 U.S.P.Q.2d (BNA) 1349, 1362 (D. Nev. 1996), on reconsideration, 42 U.S.P.Q. (BNA) 1706 (D. Nev. 1997), appeal denied, 124 F.3d 227 (Fed. Cir. 1997).

FN5. 264 U.S. 463 (1924).

FN6. Jerome Lemelson is possibly the most notorious patentee in history, being a party in cases resulting in no fewer than fifty-four (54) published decisions.

FN7. Lemelson, 40 U.S.P.Q.2d 1349 (D. Nev. 1996).

FN8. Id. at 1350.

FN9. Id. at 1350-1351.

FN10. Id. at 1353.

FN11. Id. at 1354.

FN12. Id.

FN13. Id.

FN14. Id.

FN15. Id.

FN16. Id.

FN17. Id. (quoting Henry L. McClintock, Handbook on the Principles of Equity 52 (2d ed. 1948)).

FN18. Id. at 1354-55.

FN19. Id. at 1355 (citing 1 Dan B. Dobbs, Law of Remedies, § 2.4(4) (2d ed. 1993).

FN20. Id.

FN21. Inequitable conduct refers to an equitable defense that renders patents unenforceable when the applicant fails to disclose material information during the prosecution of the patent with an intent to deceive the patent office. Molins PLC v. Textron, Inc., 48 F.3d 1172, 1178, 33 U.S.P.Q.2d (BNA) 1823, 1826-27 (Fed. Cir. 1995).

FN22. File wrapper estoppel limits the application of the doctrine of equivalents by binding the applicant to limitations which were made more specific or added to the claims in response to a rejection issued by the patent examiner during the prosecution of the patent application. Exhibit Supply Co. v. Ace Patents Corp., 315 U.S. 126, 136, 52 U.S.P.Q. (BNA) 275, 279 (1942).

FN23. Ford Motor Co., 40 U.S.P.Q.2d at 1355.

FN24. Advanced Cardiovascular Sys. v. Medtronic, Inc., 41 U.S.P.Q.2d (BNA) 1770, 1774-75 (N.D. Cal. 1996).

FN25. Id.

FN26. 960 F.2d 1020, 22 U.S.P.Q.2d (BNA) 1321 (Fed. Cir. 1992).

FN27. Id. at 1032, 22 U.S.P.Q.2d at 1328.

FN28. Id. at 1037, 22 U.S.P.Q.2d at 1333.

FN29. Advanced Cardiovascular Sys., 41 U.S.P.Q.2d at 1774.

FN30. Ford Motor Co., 40 U.S.P.Q.2d at 1356-7.

FN31. 784 F.2d 351, 228 U.S.P.Q. (BNA) 837 (Fed. Cir. 1986).

FN32. Id. at 356, 228 U.S.P.Q at 841.

FN33. Id.

FN34. Id. at 357, 228 U.S.P.Q. at 842.

FN35. 304 U.S. 159 (1938).

FN36. 264 U.S. 463 (1924).

FN37. Id. at 465-6.

FN38. Crown Cork & Seal Co., 304 U.S. at 168.

FN39. Ford Motor Co., 40 U.S.P.Q.2d at 1358-61.

FN40. Id. at 1350.

FN41. Ford Motor Co., 42 U.S.P.Q.2d at 1711.

FN42. Id. at 1708.

FN43. Id. at 1708.

FN44. The district court cited a Federal Circuit decision that dealt exactly with a proposed arbitrary limit to the length of a patent issuing from a continuation. Studiengesellschaft Kohle mbH, 784 F.2d 351, 228 U.S.P.Q. 837 (Fed. Cir. 1986).

FN45. 35 U.S.C. §§ 120, 121, 251.

FN46. 35 U.S.C. § 120.

FN47. 35 U.S.C.A. § 120, note 4 (West 1984).

FN48. 35 U.S.C. § 121.

FN49. General Foods Corp. v. Studiengesellschaft Kohle mbH, 972 F.2d 1272, 1279-80, 23 U.S.P.Q.2d (BNA) 1839, 1845 (Fed. Cir. 1992); Stark v. Advanced Magnetics, Inc., 29 F.3d 1570, 1576, 31 U.S.P.Q.2d (BNA) 1290, 1296 (Fed. Cir. 1994) ("We take judicial notice that multiple patents are not permitted on the same invention, and that there must be differences among the six patents.").

FN50. Ortho Pharm. Corp. v. Smith, 959 F.2d 936, 943, 22 U.S.P.Q.2d (BNA) 1119, 1125 (Fed. Cir. 1992); General Foods Corp., 972 F.2d at 1277-78, 23 U.S.P.Q.2d at 1843.

FN51. In re Longi, 759 F.2d 887, 892, 225 U.S.P.Q. (BNA) 645, 648 (Fed. Cir. 1985); Carman Indus., Inc. v. Wahl, 724 F.2d 932, 940, 220 U.S.P.Q. (BNA) 481, 487 (Fed. Cir. 1983).

FN52. 35 U.S.C. § 101.

FN53. Longi, 759 F.2d at 892, 225 U.S.P.Q. at 648; Ortho Pharm., 959 F.2d at 940, 22 U.S.P.Q.2d at 1123.

FN54. Carman Indus., 724 F.2d at 940, 220 U.S.P.Q. at 487.

FN5[illegible] re Kaplan, 789 F.2d 1574, 1577-78[illegible] U.S.P.Q. (BNA) 678, 681 (Fed. 1986).

FN56. Longi, 759 F.2d at 892, 225 U.S.P.Q. at 648.

FN57. Id.

FN58. Ortho Pharm., 959 F.2d at 940, 22 U.S.P.Q.2d at 1123.

FN59. Id., 22 U.S.P.Q.2d at 1123; Longi, 759 F.2d at 894, 225 U.S.P.Q. at 6

FN60. Quad Envtl. Tech. Corp. v. Union Sanitary Dist., 946 F.2d 870, 874, 20 U.S.P.C (BNA) 1392, 1394 (Fed. Cir. 1991)

FN61. Id., 20 U.S.P.Q.2d at 1394; Ortho Pharm., 959 F.2d at 941-42, 22 U.S.P.Q.2d 1124 (citing Quad Envtl. Tech. Corp.).

FN62. Webster Elec. v. Splitdorf Elec. Co., 264 U.S. 463, 466-8 (19

FN63. The Patent Acts of 1790 and 1793 contained no statutory provision authorizing reissue of a defective patent. The Supreme Court first recognized an inherent powe reissue in Grant v. Raymond, 31 U.S. (6 Pet.) 218, 229 (1832).

FN64. Philadelphia & Trenton R.R. Co. v. Stimpson, 39 U.S. (14 Pet.) 448, 449 (18 Stimpson v. West Chester R.R. Co., 45 U.S. (4 How.) 380, 382 (1846); O'Reilly v. Mo 56 U.S. (15 How.) 62, 82-3 (1853).

FN65. Compare Battin v. Taggert, 58 U.S. (17 How.) 74, 84 (1854), and Morey Lockwood, 75 U.S. (8 Wall.) 230, 240-1 (1868), with Burr v. Duryee, 68 U.S. (1 Wall.) 5 575 (1863), and Case v. Brown, 69 U.S. (2 Wall.) 320, 328 (1864).

FN66. Act of July 3, 1832, ch. 162, § 3, 4 Stat. 559.

FN67. Act of July 8, 1870, ch. 230, § 53, 16 Stat. 198.

FN68. 104 U.S. 350, 353.

FN69. Id. at 354.

FN70. Id.

FN71. Id.

FN72. Act of July 3, 1832, ch. 162, §§ 3,4 Stat. 559; Act of July 8, 1870, ch. 230, § 53 Stat. 198.

FN73. Miller, 104 U.S. at 354-355.

FN74. Id. at 355.

FN75. Ives v. Sargent, 119 U.S. 652, 662 (1887).

FN76. 35 U.S.C. § 251.

FN77. Id.

FN78. In re Graff, 111 F.3d 874, 877, 42 U.S.P.Q.2d (BNA) 1471, 1474 (Fed. Cir. 19

FN79. 35 U.S.C. § 251[2-3]; Id. at 876,42 U.S.P.Q.2d at 1473.

FN80. Graff, 111 F.3d at 876, 42 U.S.P.Q.2d at1473.

FN81. Id. at 877, 42 U.S.P.Q.2d at 1473.

FN82. Id.

FN83. Id.

FN84. Id., 42 U.S.P.Q.2d at 1473-74.

FN85. Athletic Alternatives, Inc. v. Prince Mfg., Inc., 73 F.3d 1573, 1581, 37 U.S.P.Q.2d (BNA) 1365, 1372 (Fed. Cir. 1996) (quoting General Elec. Co. v. Wabash Appliance Corp., 304 U.S. 364, 369 (1938)).

FN86. McClain v. Ortmayer, 141 U.S. 419, 424, (1891) ("The object of the patent law in requiring the patentee [to distinctly claim his invention] is not only to secure to him all to which he is entitled, but to apprise the public of what is still open to them."); Athletic Alternatives, 73 F.3d at 1581, 37 U.S.P.Q.2d at 1372 ("Where there is an equal choice between a broader and a narrower meaning of a claim, . . .we consider the notice function of the claim to be best served by adopting the narrower meaning."); Hoganas AB v. Dresser Indus. Inc., 9 F.3d 948, 951, 28 U.S.P.Q.2d (BNA) 1936, 1939 (Fed. Cir. 1993) (holding that the function of claims is "putting competitors on notice of the scope of the claimed invention."); Rengo Co. Ltd. v. Molins Mach. Co., 657 F.2d 535, 551, 211 U.S.P.Q. (BNA) 303, 321 (3d Cir. 1981) ("[The claim's] purpose is to demarcate the boundaries of the purported invention, in order to provide notice to others of the limits 'beyond which experimentation and invention are undertaken at the risk of infringement.'") (quoting Norton Co. v. Bendix Corp., 449 F.2d 553, 555, 171 U.S.P.Q. (BNA) 449, 450 (2d Cir. 1971)).

FN87. Maxwell v. J. Baker, Inc., 86 F.3d 1098, 1106, 39 U.S.P.Q.2d (BNA) 1001, 1006 (Fed. Cir. 1996) (quoting Unique Concepts, Inc. v. Brown, 939 F.2d 1558, 19 U.S.P.Q.2d 1500 (Fed. Cir. 1991)).

FN88. 104 U.S. 350 (1881).

FN89. See, e.g., Graver Tank & Mfg. Co. v. Linde Air Prods. Co., 339 U.S. 605, 85 U.S.P.Q. (BNA) 328 (1950).

FN90. 104 U.S. at 355.

FN91. Id. at 352.

FN92. Id.

FN93. Id.

FN94. In re Fotland, 779 F.2d 31, 33, 228 U.S.P.Q. (BNA) 193, 194 (Fed. Cir. 1985).

FN95. Graff, 111 F.3d at 877, 42 U.S.P.Q.2d at 1474 (quoting Wollensak v. Reiher, 115 U.S. 96, 100 (1885)); accord Webster Elec. Co. v. Splitdorf Elec. Co., 264 U.S. 463, 467-68 (1924).

FN96. See,e.g., Webster Elec., 264 U.S. at 470-71.

FN97. See, e.g., Woodbridge v. U.S., 263 U.S. 50, 56 (1923) ("Any practice by the inventor and applicant for a patent through which he deliberately and without excuse postpones beyond the date of the actual invention, the beginning of the term of his monopoly, and thus puts off the free public enjoyment of the useful invention, is an evasion of the statute and defeats its benevolent aim."); Kendall v. Windsor, 62 U.S. (21 How.) 322, 329 (1858) ("It is the unquestionable right of every inventor to confer gratuitously the benefits of his ingenuity upon the public, and this he may do either by express declaration or by conduct equally significant with language -such, for instance, as an acquiescence with full knowledge in the use of his invention by others; or he may forfeit his rights as an inventor by a willful or negligent postponement of his claims, or by an attempt to withhold the benefit of his improvement from the public until a similar or the same improvement should have been made and introduced by others.").

FN98. Compar[redacted]aff, 111 F.3d at 877, 42 U.S.P.Q.2d at [redacted], with Woodbridge, 263 U.S. at 56.

FN99. At the time of the Miller v. Brass Co. decision, the original patent term was fourteen years and could be extended an additional seven years.

FN100. 104 U.S. at 352.

FN101. Id. at 355.

FN102. Kingsdown Med. Consultants, Ltd. v. Hollister Inc., 863 F.2d 867, 874, 9 U.S.P.Q.2d (BNA) 1384, 1390 (Fed. Cir. 1988) (It is not "improper to amend or insert claims intended to cover a competitor's product the applicant's attorney has learned about during the prosecution of a patent application.").

FN103. 264 U.S. 463 (1924).

FN104. Id. at 463-64.

FN105. Id.

FN106. Id.

FN107. Id.

FN108. Id. at 465.

FN109. Crown Cork & Seal Co. v. Ferdinand Gutmann Co., 304 U.S. 159, 166 (1938) (citations omitted).

FN110. Webster Electric, 264 U.S. at 471.

FN111. Crown Cork, 304 U.S. at 160-61 (citations omitted).

FN112. Id. at 167-68.

FN113. General Talking Pictures Corp. v. Western Elec. Co., 304 U.S. 175, 183 (1938), reh'g granted, 304 U.S. 587 (1938) ("In the absence of intervening adverse rights for more than two years prior to the continuation applications, they were in time.").

FN114. See Keller v. Adams-Campbell Co., 264 U.S. 314, 317 (1924); Abercrombie & Fitch Co. v. Baldwin, 245 U.S. 198, 209-10 (1917).

FN115. 315 U.S. 759, 53 U.S.P.Q. (BNA) 1 (1942).

FN116. Id. at 767, 53 U.S.P.Q. at 5.

FN117. 29 F.3d 1570, 1576, 31 U.S.P.Q.2d (BNA) 1290, 1294 (Fed. Cir. 1994).

FN118. Id. at 1574, 31 U.S.P.Q.2d at 1292-93.

FN119. Id.

FN120. Id.

FN121. Id. at 1575, 31 U.S.P.Q.2d at 1294.

FN122. Id.; see also 37 C.F.R. § 1.324.

FN123. 29 F.3d at 1575, 31 U.S.P.Q.2d at 1294.

FN124. Id.

FN125. Id. at [redacted], 31 U.S.P.Q.2d at 1293 (quoting 26A [redacted].Diligence at 943-44 (1956)).

FN126. 784 F.2d 351, 228 U.S.P.Q. (BNA) 837 (Fed. Cir. 1986).

FN127. Id. at 356, 228 U.S.P.Q. at 841.

FN128. In re Fotland, 779 F.2d 31, 33, 228 U.S.P.Q. (BNA) 193, 194 (Fed. Cir. 1985).

FN129. 42 U.S.P.Q.2d 1706 (D. Nev. 1997), appeal denied, 124 F.3d 227 (Fed. Cir. 1997).

FN130. Id. at 1710.

FN131. Webster Elec. Co. v. Splitdorf Elec. Co., 264 U.S. 463, 464, ("The bill alleges that the Splitdorf Electrical Company had infringed claims 7 and 8 of Kane patent, 1,280,105 . . . .").

FN132. In re Graff, 111 F.3d 874, 877, 42 U.S.P.Q.2d (BNA) 1471, 1474 (Fed. Cir. 1997).

FN133. Maxwell v. J. Baker, Inc., 86 F.3d 1098, 1106, 39 U.S.P.Q.2d (BNA) 1001, 1006 (Fed. Cir. 1996).

FN134. See 4 Donald S. Chisum, Patents, § 11.05[1][b], 11-263 (1997).

FN135. 252 U.S. 126 (1920).

FN136. See 35 U.S.C. § 135(b).

FN137. Chisum, supra note 134, at 11-264.

FN138. Crown Cork, 304 U.S. 159, 167-168 (1938) (emphasis added).

FN139. Id. at 161.

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B.A., Economics, Yale University, 1967

Partner, Howrey & Simon, Washington, D.C., 1990–97

Partner, Pennie & Edmonds, Washington, D.C., 1985–90

U.S. Department of Justice, 1980–85

- Senior Trial Counsel, Civil Division, Commercial Litigation Branch, Intellectual Property Staff, 1984–85
- Senior Trial Attorney, Civil Division, Commercial Litigation Branch, Intellectual Property Staff, 1980–84

Trial Attorney, Department of Justice, Civil Division, Patent Section, 1974–78

Captain, United States Navy Reserve, Active Duty, 1966–71

LEGAL EXPERIENCE

April 1997–present - Partner, Hunton & Williams, Washington, D.C. Head of the firm's newly formed Patent Practice Group and responsible for the growth and development of the firm's practice in the rapidly expanding area of intellectual property with particular emphasis on patents. An active and growing practice in patent infringement litigations

before the International Trade Commission, in the federal district courts and before the Federal Circuit. Examples of reported decisions are: **Personalized Media Communications, L.L.C. v. U.S. Int'l Trade Comm'n**, 161 F.3d 696, 48 U.S.P.Q.2d 1886 (Fed. Cir. 1998); **Wang Laboratories, Inc. v. Oki Elec. Indus. Ltd.**, 15 F. Supp. 2d 166 (D. Mass. 1998); **Odetics, Inc. v. Storage Tech. Corp.**, 14 F. Supp. 2d 807, 47 U.S.P.Q. 1923; 14 F. Supp. 2d 800; 14 F. Supp.2d 785; 47 U.S.P.Q. 2d 1573 (E.D. Va. 1998); **Semiconductor Energy Laboratories Co. v. Samsung Elec. Corp.**, 4 F. Supp. 2d 4373, 46 U.S.P.Q. 2d 1874; 24 F. Supp. 2d 537 (E. D. Va. 1998); **Bailey v. Dart Container Corp.**, 980 F. Supp. 560 (D.Mass. 1997) and **Bailey v. Dart Container Corp.**, 980 F. Supp. 584 (D.Mass. 1997). A continuing active practice before the United States Patent and Trademark office in computer software technology and other complex electrical arts.

April 1990–March 1997 - Partner, Howrey & Simon, Washington, D.C. A member of Howrey & Simon's Intellectual Property practice and, in part, responsible for the tremendous growth of the intellectual property practice at that firm. While at Howrey & Simon, active in numerous intellectual property litigations involving single in-line memory modules, document protection techniques, pressure sensor devices, semiconductor memory storage techniques, computer software and related computer technologies. Reported cases while a partner at Howrey & Simon are as follows:

> **Hazani v. U.S. Int'l Trade Comm'n**, 126 F.3d 1473, 44 U.S.P.Q. 2d 1358 (Fed. Cir. 1997); **Wang Laboratories, Inc. v. Mitsubishi Elec. Am., Inc.**, 103 F.3d 1571, 41 U.S.P.Q. 2d 1263 (Fed. Cir. 1997); **In re Harvey**, 12 F.3d 1061, 29 U.S.P.Q. 2d 1206 (Fed. Cir. 1993); **Wang Laboratories, Inc. v. Toshiba Corp.**, 993 F.2d 858, 26 U.S.P.Q. 2d 1767 (Fed. Cir. 1993); **Marsh-McBirney, Inc. v. Montedoro-Whitney Corp.**, 939 F.2d 969 (Fed. Cir. 1991); **Personalized Mass Media Corp. v. The Weather Channel, Inc.**, 899 F. Supp. 239 (E.D. Va. 1995); **Robishaw Eng'g, Inc. v. United States**, 891 F. Supp. 1134 (E.D. Va. 1995); **The Wicker Group v. Standard Register Co.**, 33 U.S.P.Q. 2d 1678 (E.D. Va. 1994); **Wang Laboratories, Inc. v. Mitsubishi Elec. Am., Inc.**, 29 U.S.P.Q. 2d 1481, 860 F. Supp. 1448, 30 U.S.P.Q. 2d 1241, 31 U.S.P.Q. 2d 1139, 31 U.S.P.Q. 2d 1833, 32 U.S.P.Q. 2d 1641, (C.D. Cal. 1993, 1994); **Wang Laboratories, Inc. v. The Chip Merchant, Inc.**, 28 U.S.P.Q. 2d 1677 (S.D. Cal. 1993); **Wang Laboratories, Inc. v. Toshiba Corp.**, 793 F. Supp. 676, 23 U.S.P.Q. 2d 1953 (E.D. Va. 1992); **Wang Laboratories, Inc. v. Toshiba Corp.**, 21 U.S.P.Q. 2d 1155 (E.D. Va. 1991), vacated, 954 F.2d 732 (Fed. Cir. 1992); **Wang Laboratories, Inc. v. Toshiba Corp.**, 762 F. Supp. 1246, 19 U.S.P.Q. 2d 1779 (E.D. Va. 1991).
>
> **July 1985–March 1990** - Partner, Pennie & Edmonds, Washington, D.C. Office. While at Pennie & Edmonds conducted numerous appeals to the United States Court of Appeals for the Federal Circuit, including **Marsh-McBirney, Inc. v. Montedoro-Whitney Corp.**, 882 F.2d 498, 11 U.S.P.Q. 2d 1794 (Fed. Cir. 1989); and **Application Art Laboratories, Inc. v. Morita**, 883 F.2d 1028, 13 U.S.P.Q. 2d 1254 (Fed. Cir. 1989). Extensively involved in litigated patent and trademark matters in the United States District Courts of Massachusetts, Western District of North Carolina,

Southern District of New York, Northern District of California and Southern District of Florida. Also, tried several patent infringement cases relating to complex technical subject matters. See, e.g., **Trilogy Communications, Inc. v. Comm Scope Co.**, 754 F. Supp. 468, 18 U.S.P.Q. 2d 1177 (W.D.N.C. 1990); **New Balance Athletic Shoe, Inc. v. Puma USA, Inc.**, 118 F.R.D. 17 (D. Mass. 1987).

May 1980–July 1985 - Senior Trial Counsel, Intellectual Property Staff, Commercial Litigation Branch, Civil Division, Department of Justice. As the most senior litigator for Government patent matters, directly responsible for and personally conducted or assisted in the trial and/or appeal of numerous complex patent infringement cases.

Reported decisions for cases handled at the Justice Department are as follows:

Am Int'l v. United States, 227 Ct. Cl. 632, 213 U.S.P.Q. 717 (1981); **American Tel. & Tel. Co. v. United States**, 4 Cl. Ct. 157 (1983); **American Tel. & Tel. Co. v. United States**, 231 Cl. Ct. 360, 685 F.2d 1361, 219 U.S.P.Q. 316 (1982); **Carrier Corp. v. United States**, 208 Ct. Cl. 678, 534 F.2d 244, 190 U.S.P.Q. 55 (1976); **Carrier Corp. v. United States**, 209 Ct. Cl. 267, 534 F.2d 250, 194 U.S.P.Q. 82 (1976); **de Graffenried v. United States**, 228 Ct. Cl. 780, 213 U.S.P.Q. 447 (1981); **de Graffenried v. United States**, 2 Cl. Ct. 640, 224 U.S.P.Q. 787 (1983); **Ocean Science & Eng'g, Inc. v. United States**, 219 Ct. Cl., 595 F.2d 572, 204 U.S.P.Q. 438 (1979); **Orthopedic Equip. Co. v. United States**, 702 F.2d 1005, 217 U.S.P.Q. 193 (Fed. Cir. 1983); **Pitcarin v. United States**, 212 Ct. Cl. 224, 547 F.2d 1106, 192 U.S.P.Q. 385 (1976), **as modified**, 214 Ct. Cl. 799 (1977); **Starobin v. United States**, 229 Ct. Cl. 67, 662 F.2d 747 (1981); **Starobin v. United States**, 212 U.S.P.Q. (Cl. Ct., Trial Div. 1980); **Systems Development Corp. v. United States**, 209 Ct. Cl. 170, 531 F.2d 529 (1976); **Tektronix, Inc. v. United States**, 213 Ct. Cl. 257, 552 F.2d 343, 193 U.S.P.Q. 378 (1977); **Tektronix, Inc. v. United States**, 196 U.S.P.Q. 204 (Trial Div., Ct. Cl. (1977)); **Tektronix, Inc. v. United States**, 216 Ct. Cl. 144, 575 F.2d 832, 198 U.S.P.Q. 378 (1978); **United States v. Telectronics Proprietary Ltd.**, 607 F. Supp. 753, 224 U.S.P.Q. 869 (D. Colo. 1983); **Williams Int'l Corp. v. United States**, 7 Cl. Ct. 726 (1985).

Also developed a strong background in computer software and copyright matters at the Department of Justice.

1978–80 - Cooper & Dunham, New York office. As an associate at this law firm, involved in numerous litigated patent matters involving such technologies as gas discharge devices, CT scanners, ink jet printers and computer measurement systems.

1974–78 - Trial Attorney, Patent Section, Civil Division, Department of Justice. Employed as a patent attorney handling patent applications and litigated matters in the United States Court of Claims and in other federal jurisdictions.

MILITARY EXPERIENCE

Retired in December 1988 as a Captain in the United States Naval Reserve. During naval service, served as the Commanding Officer and Executive Officer of several naval reserve units. Positions as a naval reserve officer assigned to the Naval Air Systems Command (NAVAIR) in the period 1981–88 involved procurement matters for tactical naval aircraft and aircraft weapon systems. Prior to my assignment to NAVAIR, served as a naval aviator in several navy squadrons. A qualified aircraft commander in the P-3 maritime patrol aircraft and the H-1, H-2 and H-3 helicopters. During active duty in the Navy between 1966 and 1971, awarded the Distinguished Flying Cross, the Air Medal (twice for Valor) and the Navy Commendation Medal for Valor. In one assignment, served as the personal pilot for the Commander of the U.S. Seventh Fleet.

PROFESSIONAL ACTIVITIES

State Bar Memberships

- Virginia, 1974
- District of Columbia, 1975
- New York, 1980

Federal Bar Memberships

- United States Tax Court, 1981
- United States Court of Federal Claims, 1982
- United States Court of Appeals for the Federal Circuit, 1982
- Supreme Court of the United States of America, 1984
- United States District Court for the District of Columbia, 1986
- United States District Court for the Eastern District of Virginia, 1992
- United States Court of Appeals for the Fourth Circuit, 1992

Registered to practice in Patent Cases before the United States Patent and Trademark Office.

PUBLICATIONS

"Emerging Patent Infringement Problems for Government Contractors: Where Does the Buck Stop?" *3 Journal of Proprietary Rights 16* (1991) with John R. Alison

"Guide to the Protection of Computer Software in the United States," Hunton & Williams, March 1998

"Inventions Abroad Warrant Careful Contracting," *The National Law Journal*, May 18, 1998 with Tyler S. Brown

"Ownership of Patent Rights to Employee/Consultant Inventions or Other Technical Developments — A Growing Business Concern and a Trap for the Unwary," Hunton & Williams, July 1999 with Kevin J. Dunleavy and Tyler S. Brown

The prior interview summary regarding the consolidation process in this application may not accurately reflect the consolidation of this case as an "A" or "B" application per the consolidation agreement. Therefore, the instant application is being reviewed for compliance with the consolidation agreement to determine whether the application has been consolidated as an "A" or "B" application. SEE THE ATTACHED APPENDIX LISTING THE CASES CORRESPONDING TO THIS COMMUNICATION (i.e. the entire docket).

ANDREW FAILE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

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1	397371	2	397582	3	397636
4	435757	5	435758	6	437044
7	437045	8	437629	9	437635
10	437791	11	437819	12	437864
13	437887	14	437937	15	438011
16	438206	17	438216	18	438659
19	439668	20	439670	21	440657
22	440837	23	441027	24	441033
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31	441942	32	441996	33	442165
34	442327	35	442335	36	442369
37	442383	38	442505	39	442507
40	444643	41	444756	42	444757
43	444758	44	444781	45	444786
46	444787	47	444788	48	444887
49	445045	50	445054	51	445290
52	445294	53	445296	54	445328
55	446123	56	446124	57	446429
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67	447416	68	447446	69	447447
70	447448	71	447449	72	447496
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88	448116	89	448141	90	448143
91	448175	92	448251	93	448309
94	448326	95	448643	96	448644
97	448662	98	448667	99	448794
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103	448916	104	448917	105	448976
106	448977	107	448978	108	448979
109	449097	110	449110	111	449248
112	449263	113	449281	114	449291

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115	449302	116	449351	117	449369
118	449411	119	449413	120	449523
121	449530	122	449531	123	449532
124	449652	125	449697	126	449702
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133	449901	134	450680	135	451203
136	451377	137	451496	138	451746
139	452395	140	458566	141	458699
142	458760	143	459216	144	459217
145	459218	146	459506	147	459507
148	459521	149	459522	150	459788
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154	460120	155	460187	156	460240
157	460256	158	460274	159	460387
160	460394	161	460401	162	460556
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169	460677	170	460711	171	460713
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175	460770	176	460793	177	460817
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184	468044	185	468323	186	468324
187	468641	188	468736	189	468994
190	469056	191	469059	192	469078
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199	469496	200	469517	201	469612
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208	470054	209	470236	210	470447
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214	470571	215	471024	216	471191
217	471238	218	471239	219	471240
220	472066	221	472399	222	472462
223	472980	224	473213	225	473224
226	473484	227	473927	228	473996

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229	473997	230	473998	231	473999
232	474119	233	474139	234	474145
235	474146	236	474147	237	474496
238	474674	239	474963	240	474964
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244	477564	245	477570	246	477660
247	477711	248	477712	249	477805
250	477955	251	478044	252	478107
253	478544	254	478633	255	478767
256	478794	257	478858	258	478864
259	478908	260	479042	261	479215
262	479216	263	479217	264	479374
265	479375	266	479414	267	479523
268	479524	269	479667	270	480059
271	480060	272	480383	273	480392
274	480740	275	481074	276	482573
277	482574	278	482857	279	483054
280	483169	281	483174	282	483269
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292	486258	293	486259	294	486265
295	486266	296	486297	297	487155
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307	487546	308	487556	309	487565
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316	487984	317	488032	318	488058
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